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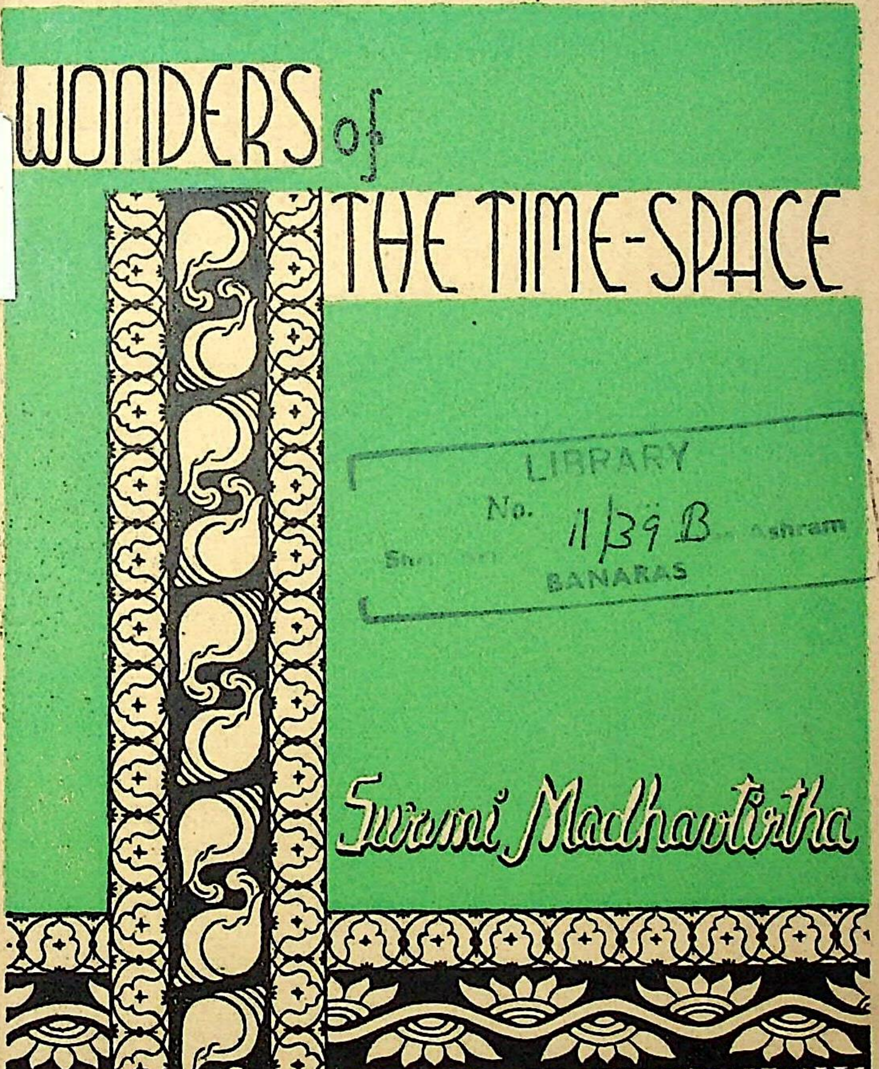

WONDERS of THE TIME-SPACE

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This book contains some of the principles of the theory of Relativity as applied to psychology and philosophy. When these principles are properly understood, they are found to support the Vivartvada (theory of illusion) and the Ajatvada (theory of non-creation) of the Vedant philosophy and will lead the reader beyond yoga and politics which believe in the theory of change.

This book has been written after thirty years of research on the subject and will be useful to those who want right thinking and right observation.

★

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WONDERS OF THE TIME-SPACE

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CONTENTS

Chapter. No.	Subject.	Page No.
1.	Method of right acknowledge.	1
2.	Nearest to truth.	22
3.	From Childhood to Manhood.	45
4.	Time–space measure in different Religions.	69
5.	Four dimensional continuum.	94
6.	Origin of the theory of Relativity.	118
7.	The Nature of atoms.	144
8.	Particles and waves of light.	156
9.	Man's relation to the world.	168
10.	What is the cause of all events ?	193
11.	Wonders of the Time–space.	220
12.	Concluding remarks.	255

APPENDIX

I. Some questions and answers. 276
II. A dialogue between poet Tagore and Einstein. 288

PREFACE

Every kind of our knowledge about the world contains some time-space division. The object known or to be known has to be placed at some place and in some time. The knower also has to remain at some place and in some time. Therefore time and space form an important part of our knowledge of the universe. Then, the question naturally arises whether the time and space as known by man are correct. This is a very important question and all the philosophers and saints and sages of the world are forced to solve it. Unless they are able to solve this question, they cannot arrive at the truth about God, man and the universe.

When the full meaning of time will be grasped, it will provide a conception so deep and all-embracing that it will undermine the whole of our present basic conceptions at the root and will reveal that we are living in a vast spiritual universe. Its pactical effect on the problems of human life will be incalculable.

The ideas given in this book were first briefly delivered in the form of lectures in several High Schools and Colleges of the Bombay Presidency. The subject itself is new and difficult for ordinary persons to grasp. Several attempts have been made and are being made in the West and the East to make this difficult subject easy to understand. Here one more attempt is made in this direction.

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In the famous Indian philosophical works such as the Gita, Upanishads, Brahmasutras, and Shri Bhagwat, sufficient explanation about the origin of time and space is not available. Only in the Yoga Vasistha some reasonable explanation is given but a more clear explanation is available in the theory of Relativity.

Some time back, I had written and published a book called "Maya" It contained a spiritual exposition of time and space, based on the theory of Relativity. Dr. Paul Brunton read that book and gave the following opinion;—

Your spiritual exposition of Relativity doctrine shows the fruits of many years you have devoted to the study and meditation upon the subject. Undoubtedly, it is through such channels, as a realisation of the philosophical implications of relativity, that science is being forced to give up materialism. Here there is a great hope for the future."

Another reader of the same book told me "you have made the first original contribution in India in combining the theory of Relativity with the Indian doctrine of "Maya".

Recently some good reviews about this book have appeared in the "Prabudha Bharat" "The Times of India Illustrated weekly" and "The Hindustan Review."

Swami Shri Tapovanji of Utterkashi (Himalayas) writes ' I am very much pleased to read your small book "Evolution and Relativity'. You argue just like Gaudapada who is considered to be the great interpreter of अजातवाद (the doctrine of non-creation). But all his arguments depend upon mere श्रुति (Scriptures) and अनुमान (inferences). You argue strongly sranding upon the rock of modern science. That is the difference. Therefore, I think your arguments will be more appreciated by the modern educated men."

These reviews and other opinions received on my previous books and lectures on this subject encouraged me to prepare the present book.

Swami Shri Tapovanji further writes "But what is the nature of the observer? Is it real? Is it eternal? Is it one or many? Why does it observe? These are the questions to be discussed in another book with the assistance of modern science." I have answered these four questions in appendix A of this book.

In the Indian religious scriptures, the age of the creator of the World (ब्रह्मा) is considered to be 100 years, by his own measure. Of this 50 years have already passed. The present period is the first day of the second half of his life (Bhagvat 3-11-32-33) In one day of that creator there are 1000 Chaturyugas. One Chaturyuga is equal to 4.320,000 human years. This is arrived at as follows. 360 days of a man is equal to one human year and this is equal to one day of Deva:-The western world considers that a human year is equal to 365 days. The Indian Calender increases one month at some intervals. 1200 years of Deva are equal to Kaliyuga, 2400 years of Deva are equal to Dwapar Yuga, 3600 years of Deva are equal to Treta Yuga and 4800 years of Deva are equal to Satyuga.

This means that one Chaturyuga is equal to 12000 Deva years and this is equal to 43,20.000 human years.

When this is multiplied by 1000, it becomes Brahma's (Creator's day). i. e. Brahma's day is equal to 4,32,00, 00,000, human years. Besides, Brahma's 1000 Yugas are equal to a moment of Vishnu and Vishnu's 1206,000 moments are equal to 1/2 moment of Rudra. When this time is taken in an objective way, Indian concept of time goes back to the most earliest period as compared with other cultures of the world.

From the subjective point of view, if Rudra's time Vishnu's time, Brahma's time, Deva's time and human time are different, they cannot speak with one another. Just as a waking person cannot speak with a dream person because their times are different and animals cannot speak with men because their time-orders are different, so a man cannot have any talks with Vishnu. But in the Puranas, those having different time orders have been allowed to talk with one another. If Manu's time order is different from the time order of Brahma, Manu cannot be the son of Brahma. When the Supreme spirit gives vision to his devotee and talks to him, the former assumes the time of the devotee but he cannot remain there for a longer period because he has a life of a different time order.

The present Republic Government of India has adopted the Christian Calender in order to have the convenience of correspondence with the foreign countries. In the Indian history, as written by the British Rulers and as is still being taught in our high schools, Akbar ruled India from 1556 to 1605. But Akbar himself did not know anything about these years, as the Christian Calender did not exist in his time.

Originally the Christirn Calendar consisted of 360 days. They may have adopted this from the Oriental Calendar. It is also possible that the Western world may have adopted the seven days viz. Sunday, Monday &c. from the Indian Calendar. After the beginning of the Roman Empire, the Roman Emperor Julius Ceasar raised the Christian year to 364-1/4 days. In the Sixth century Dionisus made some improvement in this but as it resulted in a difference of 11 days in 1732, Pope gave an order in that year that 3rd September should be called 14th September and February should thave 29 days when the current year can be divided by 4. Also that the year should begin with January. This order was immediately accepted by Italy. Denmark, Holland, Germany and Switzerland accepted it in 1759. England in 1859, Ireland in 1839, Russia in 1859. India accepted this Calendar in the beginning of the British rule.

Some of the Indian Astrologers say that even in the present Christian Calender, there is a small mistake according to the measure of the sun's motion and that after 3600 years there will be a difference of one day.

The main question is 'what is a true time and a true day'. Why should we take the solar day as the only correct day, by sitting at one place on the earth ?

Many calendars are now known to be existing in our human world viz:—

1.	Manu's year.	1,972,949,050
2.	Chinese year	96002449
3.	Parsi year.	1899177
4.	Yudhisthar	5050

5.	Greek.	2714
6.	Buddha.	2524
7.	Jain	2476
8.	Vikram.	2006
9.	Christian.	1950
10.	Shalivahan.	1871
11,	Hijri	1369
12.	Egyptian,	27603
13.	Persian.	5954
14.	Judai	5710
15.	Rome	2701
16.	Bengali	1356
17.	Gandhi.	80

The above are some of the calendars only in our man-sized world. If every living being viz. a horse, an elephant, a dog, cat, monkey, fishes, birds and reptiles &c. have the capacity to give their calendar years, it will not be possible to count their number.

Besides, how to count the time when for instance some creatures like owl cannot see the sun, some cannot see the moon, and some, for instance, living at the bottom of the sea cannot see day or night.

Therefore, time and space are subjective. They depend on the scale of observation. This is proved by Einstein by means of mathematics. It is one man revolution made in our own times. It is worth studying. But there are very few books to explain this subject easily. I came to know about this subject in 1920 A. D. It was briefly explained in a book "Tertiam Organum" by Ouspenky. But the subject attracted me so much that, thereafter I tried to study any book that I found on this subject. It was difficult for me to grasp the mathematical portion but it was not difficult to grasp the moral behind this discovery. Subsequently, I began to apply it to the Indian philosophy. Then I found that *if this new theory of Relativity be applied to politics, we may destroy all the political national histories of the world without losing any good element in our culture.* This step, I am sure, if boldly taken, will stop all wars and will bring permanent peace in the world. But it requires boldness of thought and boldness of feeling. I can only pray to God that such step may be taken for the good of humanity. This small book will help the readers to understand that such step is necessary.

The following simple example will show that past, present and future are relative. Imagine two worlds A and B at a distance of 4 light years from each other and also imagine that the world A is 10 light years distant from us. As you observe through a very powerful telescope, some event happening on world A, it is the present to you. However, that event was ten years in the past to an inhabitant of world A and 6 years in the past to an inhabitant of world B. Now let an observer on world B watch an event on world A. It is the present to him but it may be some years in the past to an observer on world A and some years in the future to another observer. Thus past present and future have no absolute meaning; they are merely relative terms. So you cannot tell that time is same at two different places. There is no objective past and there is no objective future according to the new physics.

Therefore, our histories and geographies require to be modified i. e. we should give cultural histories instead of political histories in the hands of the students. A cultural history brings the future in the present because the spirit is not in future. There should be a world-wide rejection of all political and social theories which place man's supreme good in future. The history of the world during the past 200 years is a history of social confusions when large numbers of those who should be sages and saints have abondoned spiritual work in favour of money and political power. When such men formulate a philosophy of life, social and political confusions result.

Generally, events are taking turn according to circumstances and circumstances are created according to the nature of vents, but when a super-man appears on the field, events begin to take a new turn. In war, a good field-marshal is very often able to change the course of events. Similarly we require a good field-marshal in culture to change the inertial field-system in which humanity is moving through ignorance. As there is a biological field and a social and political field, so there is an all embracing spiritual field.

In dreams, we get experience of wonderful changes in time and space because we cannot control the inertial system. The dream as a dream does not permit us to doubt its reality. In the waking life also when we are brooding over some events, we do not doubt their reality. There is, then, an appearance of one regular time-space system. But this is an error. Our attachment to the waking field disappears (1) in sleep (2) at the time of death (3) when we rise to a spiritual state.

When a man transcends time and a space ever so slightly or infrequently, he becomes a total person. Time deludes people into the false and desparing hope that everything ends in time. It does not and cannot. It is we who with our greed and fear make the illusion of time. But because time is an illusion which we project, we can not be ended in time by time.

Pandit Jawahirlal Nehru writes in his book "The Discovery of India" that "Perhaps the conception of relativity brings us nearer to the meaning of Maya." Properly speaking, Relativity is essentially a problem in the theory of knowledge as well as in physics.

The only events, the observer actually experiences are events at himself. One can select one particular system of graduation of his clock sub-divisions but he can not call it a true and uniform time. Uniform time is not definable.

Therefore, the phrase " Age of the Universe" has no objective content; given an event, we have to mention an observer in whose "now" it occurs and the ages are different according to the observers chosen. The world system though decaying and dying at each separate place and for each separate observer always comprises other observers for whom this process of decay has hardly gone on at all. Propositions about the state of a system prior to the moment at which it is first given are meaningless. A whole range of times can be assigned to the same event, depending on the observer who observed it.

Recently, there has been valuable improvement on the Theory of Relativity made by Professor Milne. The point common to the relativities of Einstein and Milne is the fixed number of "C" i. e. the velocity of light. With Einstein the logical status of such fixing is seen in the empirical fact that the velocity of light (as measured) is constant for all observers. On the other hand in Milne's treatment, "C" is an agreement between observers to use the same numerical factor in building coordinates out of each man's immediate temporal experience. Milne's treatment enables (a) the basis of physics in temporal consciousness and (b) the ground for communicability of any scientificc information to become inter-related. Since relativity of Einstein inevitably deals with distant events, its interlocking of temporal and spatial partition of intervals by distant observers has been allowed to obscure the importance of temporal experience at the observer. The whole develpment of Milne's work has been to emphasise that there can be no unique measure of time.

After Prof. Milne's improvement, the theory of Relativity, has attained its full significance for the theory of knowledge because the basis of that significance is shown to lie in time. Milne has pointed out a reason for logical priority of time measurement over distance measurement. To measure length, you must say what you mean by two points at the some time and thus in principle you need a definition of distance simultaneity. To measure a time, you need only say what you mean by two events at the same place viz. in your individual consciousness. When you have achieved a definition of simultaneity between distant events and events at your self, you have enough data to assign distant measure to an event without ideal rigid scales or other impediments of traditional relativity.

No school of thought can now build or demolish arguments about the fundamentals of existence without implying or explictly stating some view as to how and why we experience events in a time sequence and whether such sequence is basic or superficial. If a star is at a distance whence light takes years to come, while it takes minutes to come from the sun, a sequence of changes affecting both bodies may appear to one person to have been completed in the sun before it begins in the star but to an observer on any planet which might be associated with the star, the contrary might be true. B. Russell, therefore, correctly says that both in thought and feeling, to realise the unimportance of time is the gate of wisdom. Temporal and spatial notions interchangable in geomety are also interchangable in epistemology or even in metaphysics. As time has become relative, it helps us very much in the analysis of the structure of our knowledge.

There is, yet, considerable scope for improvment in Milne's kinematic relativity. His frame of reference is created by reference to an embodied spirit. This principle is useful in physics but not in philosophy. The nature and time-space of the embodied person in waking state undergo considerable changes in the dream state, in sound sleep and in the disembodied undifferentiated spiritual state. When the personality shifts, time does not mean the same thing. As soon as the relationship is changed, the former ideas will disappear.

About 30 years back, a prize of 3000 dollars was offered to anyone who could explain Einstein's theory of relativity without mathematics. This prize was won by Mr. Bolton of the British patent office. Similarly it is necessary to create another prize for explaining Prof. Milne's kinematic relativity without mathematics. A small attempt has been made in this direction in Martin Johnson's book "Time, knowledge and Nabulae" but he has left the subject incomplete. This book will show the direction in which further research can be made.

As stated above, no object could appear at all if it did not appear in space, as no event could happen if it did not happen in time. For objects stand near or far from each other as events occur before or after each other. Hence every time we observe an external thing or event, we are compelled to observe it as existing in a particular kind of space time. This is not because the thing or the event itself is in such an order but because our human observing process itself works in that particular way. And unless we can observe the world in this way, we shall not observe it at all which means that we shall have no experience of it. It is, therefore, necessary to understand how we experience different events and whether our knowledge is correct. Success in right thinking and right observation means success everywhere.

It is said in the Upanishads एकेन विज्ञानेन सर्वं विज्ञातं भवति।

i.e. by knowing the one, all is known. This means that the observer must try to know himself. All the knowledge of all the libraries of the world is contained in this one sentence.

The evils of the modern world appear to be of a different kind. They have brought about a very great disintegration in human love and in human knowledge. This tendency will have to be stopped sooner or later. The old religions and the present Governments of the world have not been able to stop the present disintegration. The Christian religion has got some determinate moral commandments but there is no sound philosophy in its back-ground to shift the personality. Muslim religion is in the same position. Mahatma Gandhi also gave determinate moral commandments. He attempted to give a new philosophy of life but could not succeed. Although in the beginning of his Satyagraha movement, he said that God and the world are not separate, he could not bear to see the terrible happenings that he witnessed in his last days. All the theistic religions (i.e. those which have no sound philosophy) are aggresive. To insist on the Prophet and his law is misleading. As the Prophet's commandments and behaviour and teachings of his God vary from one theistic religion to another and are in many instances contradictory, these religions have great difficulty to get on with one another. The Western religions have failed (1) to prevent wars amongst its followers (2) have produced a spirit of sacrifice in military battles with a view to keep a modern nationalist state (3) are trying to convert other nations to their point of view. The result has been that people have begun to consider that a good death is better than a good life and that others must be improved before his own life improves.

If humanity wants to progress on the right lines, it will have to remove the evil effects now being created through cinemas, radios, newspapers and sensual novels. It will have to improve the breed of human beings and control population.

There are two methods of securing integration (1) by uniting the differences and (2) by denying the differences. The first method takes a long time. The second method will give integration earlier if the principles of the theory of Relativity are properly grasped. The main problem in the east and west is not about a simple issue between good and bad but has a complex conflict between different concepts of what is good. Without the basis of a sound philosophy, it will be difficult for human beings to understand what is good. The determinate personality cannot be immortal even if it is preserved in the grave. No good state and no good life can be conceived in strictly economic terms. The culture of the nineteenth century has given slums and offices and factories. The twentieth century is offering atom-bombs and hydrogen bombs, and reoccuring meetings of foreign Ministers.

If there would be one Government for the whole world, there will be no foreign ministers and huge expenses for competition in arms will be saved. In this case, histories will have to be written again to suit the world-government.

Some persons are raising a question as to whether the discovery of the theory of Relativity will make a change for better in the Western culture. I think that it will. Several good writers on sociology and humanities, economics, politics and psychology are making use of this theory and are reconsidering past, present and future problems in the new light. Two things are necessary for a better culture. Right thinking and detachment from sensual enjoyment. The theory of relativity helps us in right thinking but who will turn the attention of humanity away from the sensual enjoyments increased by many other objective sciences? That is a big question. High thinking must be combined with plain and simple living. India has got both these things and can offer it to the world through its sages who are leading a life of plain living and high thinking.

Western culture places time as a moving river which comes out of a distant place and past which are not here and now and which goes into an equally distant place and future which also are not here and now, whereas the oriental culture portrays time as a placid silent pool within which ripples come and go. After the theory of relativity, the western culture is undergoing several changes and it is possible that they will accept that human affairs and the ultimate reality are indeterminate. A wise men knows that determinate things are transitory and hence they should not be elevated into immortal principles. A good conduct in morality or religion is that which leads to the eternal Brahmā State. The finest summary of the oriental philosophy is the desire to be in tune with the whole. A free society must do more than allow each person to vote; it must provide for such education as would enable each person to come to fulfilment, not in the economical sense but in the spiritual sense. We must first know what we stand for and what we are working toward. Much confusion can be avoided by applying the field theory of Einstein to psychology and to philosophy, so that it may be possible to include all the events of the universe therein.

As stated above in Einstein's earlier theory, there was a barrier against associating physics with any rational analysis of knowledge and therefore there was divorce from experience due to not building relativity upon events in immediate consciousness. This barrier has been removed by Prof. Milne. As Milne's time measures are personal, it is easy to compare waking time-measures and dream time-measures and ascertain their laws. Some work has been done in this direction both in the east and the west. It is necessary to make this subject as easy as possible. The following pages will help the reader to understand the subject more easily and to apply it to psychology and to philosophy.

A human being may be a patient to the doctor, a voter to the politician, a student to the educationist and so on. A woman may be a daughter to some one, a mother to some one, a wife to some one and aunt to some one. Each observer calls out that aspect of the person which strikes the chord in himself and there is scarcely an observer who rises to perception of the entire human being. The whole can see the whole. Higher development of realisation can be won only by the whole personality, not by training the intellectual faculty alone as is being done now in schools and colleges.

The ideas we have formed about the physical universe even down to such bed-rock fundamentals as the conception of space-time have their origin in the relationship which holds between the human observer and his finite level. Change this relationship and these ideas will go. They have no finality in themselves. It is therefore futile to take them as self-existents or as fundamental data upon which to found a philosophy. Such a philosophy is doomed to remain at best a relative and provisional expression of truth.

When the illusion of the space-time order which links together the entities in our present world is removed, our present world would be represented by something admitting of a far greater degree of interpenetration. This will necessarily lead to a perfect spiritual state. In dream, we see many persons and can talk to them. When we wake up, there was only one person. Dream time and dream space had converted one into many. Waking time changed them into events for one observer. The same agrument holds good for many persons in the waking state. They are not objects to be seen but events in the observation of the observer.

In the kinematic relativity of Milne, it has been proved that the description of the universe by an observer at the centre of our own galaxy would be different for example from its description by an observer at the same place but moving with, say, one-third the speed of light. If so, we may expect that the description of the laws of nature by two such observers would be different. This is also proved in the dream condition where the description of the world differs when the dreaming observer is moving with different speeds, from the same place, on different occasions.

If an aeroplane goes from the West to the East, the nights are becoming shorter and vice versa if an aeroplane goes from the East to West, the passengers are feeling that nights are becoming longer.. At every place where an aeroplane lands, the passengers are asked to correct their time. They are also informed about the temperature of each halting place. This is something like a man taking birth for a short time in a new field.

As there is no determinism in time and space, there is no determinism in history and geography and the sooner we forget them, the sooner we shall obtain the benefits of integration. That man can be free who knows that in his essential nature he is indeterminate specially with regard to time and space. At any time man can withdraw into the indeterminate aesthetic component of his nature by giving up any commitment to determinate transitory qualities. and because of this quality he may also freely accept some determinate works.

In the year 1944, I had a talk with Shri Raman Maharshi about the theory of Relativity. He pointed out that the very presumption of two observers being situated at two given points is itself an unwarranted one i. e. taking for granted that there are two individual observers, the notion of relativity must itself apply to the space-measure separating the two; in other words, the space between one observer and another being relative and unreal, there cannot be more than one real observer. Shri Raman Maharshi's experience that there is only one observer in the world is also corroborated by the following proofs:—

1. Pro. Milne says that the only events which an observer actually experiences are events at himself.

2. Pro. Einstein says that the structure of space is not determined unless the functions of the co-ordinates are known.

3. In the Vedant Sidhant Muktavali Swami Prakashanand has given several examples to prove that there is only one observer in the world. One cannot know

the knowledge or ignorance of another observer, because, it is not the object of sensual knowledge.

4. The most important sentence in the Gita is:—

One who knows everything as the Supreme Divine is the real sage. It is difficult to come across such a sage. (7–19)

5. Shri Krishna says to Udhava in Shri Bhagwat (11–13–30) that if an observer does not remove the differences of the waking state, he is still in the dream state.

6. In the Katha Upanishad, it is stated:—

He who sees differences will be subject to the cycles of birth and death.

7. In the Purush–Sukta of the Vedas, it is stated:—

All this that is present, past and future is nothing but one Suprĕme person.

8. "I" is a singular pronoun. If I consider that "we" is the plural of "I," I shall have to take thou, she, it or he into consideration, which is absurd.

9. As dream space is not created before the dream-begins, the space in the waking period is derivative and not fundamental.

10. B. Russel says " If I refuse to accept non–mental events because they are not verifiable, I ought to refuse to admit mental events in every one except myself for the same reasons.

11. An Italian philosopher Gentile writes "When we compare two or more acts, we ought to notice that we are not in that actuality of the soul in which multiplicity is Unity, for in that actuality the comparison is impossible.

12. An event is not an object, number cannot enter into what cannot be objectified.

13. Distance is defined by certain operations of measurements (Maya) and not with reference to non-sensical conceptions such as the amount of emptiness between two points.

14. T. H. Huxly says that if distance and place are inconceivable in the absence of the mind of which they

are the ideas, the independent existence of figure which is the limitation of distance and of motion which is change of place must be equally inconceivable.

15. Perceptual space is within the perceptual event, therefore no observer can go beyond his own perceptual world. If he wants to go, he must take another birth. This is the reason for suicide. This is also the reason why sages take to Sanyas (world-renunciation). Transcendentatism is a most difficult period in human life. It is difficult to assume a velocity which will take the observer outside the system. It is, therefore, necessary for a genius to create a new system by which the whole of the previous system will go. As waking condition destroys the dream completely, spiritual State must destroy all the previous experiences. Therefore, no political man who learns past history and thinks about the future will be able to meet God. He must go to the doors of the sages and take Sanyas or adopt that stage and acquire a knowledge beyond history. There is no objective past and objective future according to the new physics. An American philosopher Northrop also says that the asthetic self and the asthetic object are the one asthetic continuum.

It will be seen from the above that there is only one observer in the world. Difficulties will arise when we create other observers (as in dream) and form relations with them. The only cure for these difficulties is:—

1. Right observation and right thinking for individual development.

2. For social development.
    (a) integral education;
    (b) control of population;
    (c) one Government for the world;

(d) control of consumption by means of control over senses;

(e) all national and political histories to be destroyed;

(f) capital, labour, and power to be resposible to men of wisdom.

In several important philosophical Sanskrit Books in India, there is a tendency to repeat important ideas. This is necessary for the development of right culture. I have adopted the same method and repeated certain important ideas in this book.

I am living in solitary place on a river bank with the object of giving sufficient attention to these principles. Therefore, there was some difficulty in keeping continuous touch with the printing press. Some mistakes have occurred in proof-reading and printing. for which an errata is given at the end of the book. I shall be glad if some good and reliable publisher in the east or west will undertake to print a second editon of the book without mistakes.

My thanks are due to Mr. J. M. Oza B.A. B.T., Assistant teacher of the Model High School, Ahmedabad for helping me in proof-reading and to Mr. J. J. Asana M.A., retired professor of the Gujarat College, Ahmedabad, for suggesting important books on this subject for my study.

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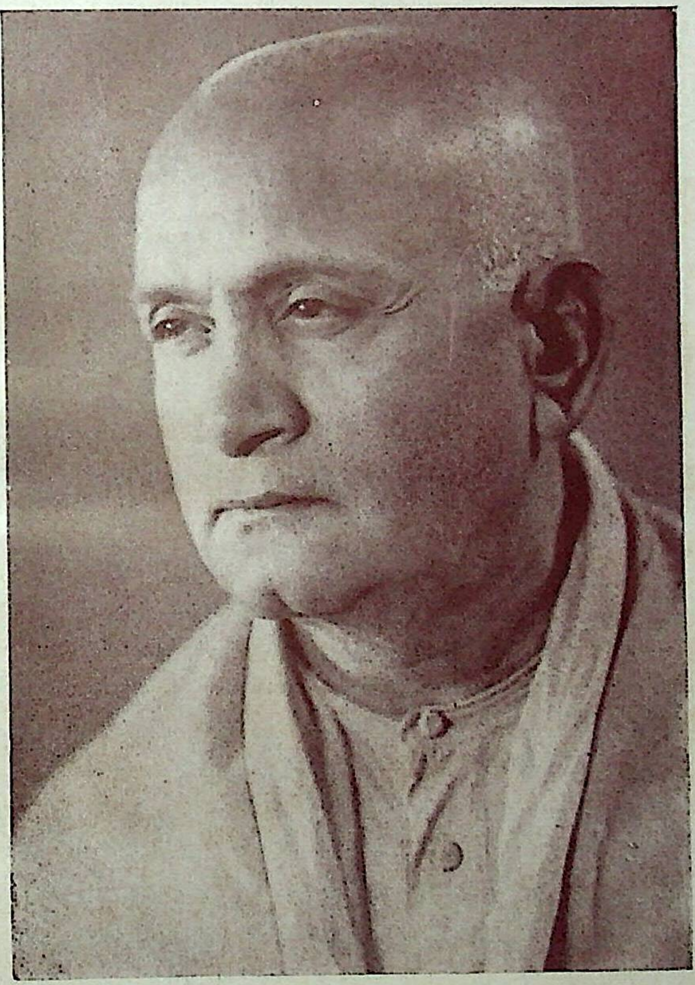
15th: August 1950

Swami Madhavtirtha



Swami Madhavtirtha

This photo was taken on the day on which the author gave two lectures on the theory of Relativity to the students of the M. T. B. College at Surat (India) in Feb. 1950.

CHAPTER 1.

Method of right knowledge (Epistemology)

It is first necessary for us to know
(1) which life is better and
(2) what is true knowledge.

With regard to point one, it is easy to understand that the life of a tree is better than the life of a stone, the life of an animal is better than the life of a tree and a man's life is better than that of an animal. Amongst human beings, an active man **(राजस)** is better than a dormant **(तामस)** man and a moral man **(सात्विक)** is better than a mere active man. Lastly the life of a self-realised man **(ब्रह्मवित्)** is better than the life of a moral man and the life of one who is settled in the spiritual state **(ब्रह्मनिष्ठ)** is the best of all lives. In the last stage, a man is able to know the truth of the individual, the truth of God and the truth about the universe. For this purpose, right thinking in necessary. Some of the experiences of the past and present Hindu saints, are also helpful to us, in right thinking. Buddha and Jain philosophers also agree that right thinking leads to salvation.

Right thinking depends on right measurements in thinking. It is called praman **प्रमाण** in the

Indian language. For finding out the right measure or praman, the best work in the Hindi language is Vriti Prabhakar वृत्ति प्रभाकर by Sadhu Nischaldasji. It is somewhat difficult to understand, but it is very useful for those who want to think clearly on complicated philosophical problems. Some tailors keep ready made clothes as some buyers like to purchase them. Similarly, some readers like to read some classical authors. Good authors, do help the readers in right thinking.

To arrive at the right knowledge about the world, the theory of Relativity and the Quantum theory are very useful. In modern times, many scientific discoveries have been made. The following five are the chief amongst them:—

1. Aeroplane.
2. Radio.
3. Talkie Cinema.
4. Theory cf Relativity and
5. The Quantum theory.

The results of the first three scientific discoveries are known to ordinary persons because of their practical use in ordinary life. But it requires a very keen intelligence to understand the last two discoveries. The theory of Relativity is discovered by professor Einstein. He has given a new vision about our knowledge of the world. Bernard Shaw says that Einstein has made a universe. B. Russell says that Einstein is our greatest man in the last half Century. Several good thinkers also consider that it is a one man revolution in our world. That theory contains a combination of space and time and a uniform velocity of light for all systems. Besides this these subjects are proved by mathematics, but they are so difficult that very few persons have so far been able to understand them thoroughly. In 1921, one person offered a prize of 3,000 Dollars to any one who could explain this theory without mathematics. This prize was won by Mr. Bolton of the British patent office. I have spent about thirty years to study this subject with a view to see whether this new science can be applied to psychology and also to philosophy. Some thinkers in the Western countries have also made attempts in this direction. Their names are:—

Sir James Jeans
Sir A. Eddington
B. Russell
Prof. Milne
Ushenko
Richard Eriksen
Paul Brunton
Martin Johnson.
A. Whitehead

The new physical science divides the world into three parts viz:—

1. Our selves.
2. Our Experiments with the world and
3. The External world.

In the Vedantic language, these are called प्रमाता, प्रमाण and प्रमेय. The new physical science begins by correcting the instruments of measurement. The subject of study for modern science is not nature itself but our observation of nature. In the old science, people used to believe in the existence of the external world independent of the perceiving subject. After the discovery of the theory of Ralativity, Science has concentrated more on no. 2. i. e. instrument of measurement. If one goes to a tailor for making clothes, the tailor first wants to ascertain measurements. In psychology and in philosophy also, it is necessary to find the right measure for whatever statement of facts made therein. For instance, if we want to find out whether our civilisation is going backward or forward, we must first find the right measure for our judgment. In legal cases also, the law of evidence is the principal law.

In the theory of Relativity, time is included in the measure. i. e., time is taken as a dimension in the same way as space i. e., as the three dimensions of space can be changed, time also can be changed by changing the condition of the observer. It is still difficult for ordinary persons to understand what is meant by the relativity of time but when several simple and easy books will be written in future to explain the relativity of time and space, the following results will be seen in our knowledge viz—

1 Birth and death will be relative.
2 Creation of the world will be relative.
3 Histories and geographies will be relative.
4 Newspapers will lose their importance.
5 Politics will be simplified or there will be one Government for the whole world.

Measure plays a very important part in practical life and especially in ascertaining the truth of all events. Pure thought can grasp reality if it can get the right measure. The new Science says that in the limitted nature of the mathematically existent simple fields and the simple equations possible between them lies the theorist's hope of grasping the real in all its depth. The simplest system is one which contains the fewest possible mutually independent postulates or axoms. For instance, in the Indian philosophy, the Sankhya system contains two independent elements viz Purusha and Prakriti; Yoga contains three viz:— God, individual purush and nature or prakriti.

Vedanta contains only one independent element viz Brahman ब्रह्म. Therefore, Vedanta system of thought is considered superior to all other systems. Similarly the new science of Relativity and the quantum theory contain the smallest number of independent elements. The theory of Relativity has ruled out the existence of forces acting at a distance with the resulting destruction of the notion of absolute simultaneity. Inertia, gravitation and the metrical behaviours of bodies and clocks are in this theory reduced to a single field quality. This is called क्षेत्रधर्म in the Indian philososhy.

In the theory of Relativity, time–space co-ordinates are relative in so far as they depend on the state of motion of the selected inertial system. This means, in other words, that each inertial system contains its own special space–time. At this stage it is necessary to understand what is an inertial system. It has been known since the days of the ancient Greeks that in order to describe the movement of a body, a second body is needed to which the movement of the first is referred. The movement of a vehicle is considered in reference to the earth's surface, that of a planet, to the totality of the visible fixed stars. In physics, the body to which events are specially referred is called the co-ordinate system. A co-ordinate system which is admitted in mechanics is called an inertial system. Besides, a co-ordinate system that is moving uniformally and in a straight line relatively to another inertial system is likewise an inertial system. The theory of Relativity has been so formulated as to apply this definition to any natural event. This principle will be made more clear in the following chapters.

Inertia means Tamas **तमस.** We can only calculate the behaviour of bodies from some point of view. This means that the system must be considered as having the character of inertia, and this system contains its own time-space measure. Nyaya, Vaisheshik and Sankhya systems of thought maintain that time is derived from Tamasik ego, which is the basic character of the inertial system under consideration.

According to the physical science, electrical masses in motion produce a magnetic field whose energy acts as a model for inertia. To this, the theory of Relativity adds that there is physical equivalence of all inertial systems, when each is considered from the point of view of the measure contained there-in. The result of this is that space and time are merged into a single continuum in the same way as the three dimensions of space;

in other words physical space is extended to a four-dimensional space–time–continuum. This has resulted in a metrical field. If the reader wants to understand what sort of metrical field is here taken into consideration, he can get some idea thereof, if he tries to understand the Indian Astrologer's Kundali. In India, when a child is born, the parents generally consult an astrologer to find out the future events of the life of that child. For this purpose, the astrologer obtains from the parents, the time and place of the child's birth. After this information is furnished, the astrologer prepares a Kundali which is similar to the metrical field of the theory of Relativity. This is also the inertial system for the life of the child. This system can be changed only when the child grows up and gets the ability to change his time-space measure by yoga or higher spiritual knowledge; otherwise, the man remains under the control of a man–sized time and a man–sized space. As fields are physical conditions of space, so the Kundali represents the continuous field of the human time–space measure. The structure of space is not really determined until the coordinates are known: therefore the astrologer first asks for the time of the birth of the child. The time of the birth of the child gives the initial conditions for the motion of the child in his world-line. But the motion and the world-line are relations. They are subject to change at any instant when the condition of the observer is changed. The time–space structure is not absolute but depends on the physical and psychological influences of the child that is born. The co-efficients of the metric or the Kundali describe the gravitational field with refernce to the co-ordinate system selected. A natural formulation of the principle of equivalence is, therefore, found the extension of which to any gravitational field whatever forms a perfectly natural hypothesis.

Rest and motion have became relative. A ship which is becalmed is at rest only in a relative sense i. e. relative to the earth but the earth is in motion relative to the Sun, and the ship with it.

The new science of relativity has proved that our view of the world depends on the measure by which we have obtained that knowledge. This can be understood easily by means of examples some of which are given below:—

Example 1.

There is the Arabian Sea near Bombay. A fisherman in Bombay throws his net into the sea to catch some fishes. Supposing there is another fisherman at Versova (about 15 miles from Bombay) and he throws a different kind of net in the same sea and gets different kind of fishes into his net. Suppose that both these fishermen happen to meet and compare the results of their catch. The second fisherman asks the first why he is getting only one kind of fishes. The first replies that here in Bombay the sea is such. The second man says that it is not the nature of the sea (because the sea is common to both of them) but there is a difference in the net. The first fisherman made a mistake in attributing the nature of his net to the nature of the sea. Applying this example to the external world, we say that the world is such and such but it is not a fact. Our view of the world depends on the measure by which we have obtained that knowledge. This example makes it clear that a man should not see nature as something entirely distinct from himself. An object is nothing more than the sum of the impressions it makes on our minds, so that it has no existence except in so far as it is perceived by a mind or existed in a mind. The new science says that mass, motion and size of a body are as much secondary qualities as the colour of a chair. The theory of Relativity asserts that the laws of phenomena in the system of bodies for the observer who is connected with it will be the same whether this system is at rest or is moving uniformly and rectilinearly relatively to another system. The theory of Relativity and the Quantum theory are not merely new discoveries as to the content of the world; they involve changes in our mode of thought about the world. In other words, our knowledge of the external world cannot be separated from the notion of the appliances with which we have obtained that knowledge. In the Indian philosophical language, the appliances are called प्रमाण: which have the same character as the measures of the science of relativity.

The Indian philosophy agrees with the present science that no complete view of the Universe can be obtained so long as we separate our consciousness from the world of which it is a part. It is a one-sided view which takes the environment to be all important and the conscious spirit to be unessential. The idea that perception in itself reveals the true character of objects is a fond delusion and is one which it is very necessary to overcome if our philosophy is to be anything more than a pleasant fairy tale. B. Russell says "we naturally think of the universe as being in one state at one time and in another at another time. This is a mistake. There is no cosmic time and so we cannot speak of the state of the universe at a given time. Similarly, we cannot speak unambiguously of the distance between two bodies at a given time. If we take the time appropriate to one of the bodies, we shall get one estimate; if the time of the other, another estimate. The only way to get clear is to make a fresh start with events instead of with bodies. It is impossible for two persons at the same time to have exactly identical percepts. Therefore, the space of percepts like the percepts is private. There are as many perceptual spaces as there are percipients. Given two events A and B in different regions, it might happen that according to one convention, they are simultaneous, according to another, A was earlier than B and according to yet another, B was earlier than A. Consider for instance the event of Mahatma Gandhi's death. It occurred on 30th, January 1948, Friday evening. The American people say that the event occured on Friday morning, because there was morning in America at that time. Japanese say that the event occurred on Friday night. For the newly–born babies that event has not happened. They did not know who was Mahatma Gandhi and what was birth and death. The World of a child is different from the world of adults. Amongst adults also the world of the females is different from the world of the males. The world of the poor is different from the world of the rich. This means that every man is living in his own world, just as every man is dreaming his own dream. There is no direct spatial relation between what one person sees and what another sees, because no two persons see exactly the same object. Each person carries about a private space of his own which can be located in physical space by indirect method but which contains no place in common with another person's private space. This shows how entirely physical space is a matter of inference and construction. The same is the case with time. Einstein substituted events for objects; each event has to each other a relation called "interval" which can be analysed in various ways into a time-element and a space element or time-space element. The choice between these various ways is arbitrary and no one of them is theoretically preferable to any other. The old view was that there is one cosmic time and that given any two events in any two parts of the Universe, either they are simultaneous or the first is earlier than the second or the second earlier than the first. It was thought that the time-order of the two events must always be objectively definite although we might be unable to determine it. We now find that this is not the case. Events which can be regarded as all in one place or all parts of the history of one piece of matter can have a definite time order. So do events in different places if light can travel from the place of the one event to the place of the other so as to reach the other place before the second event. But if light travelling from the place of the one event to the place of the other event arrives at the place of the other event after the other event has taken place and conversely, then, there is no definite objective time order of the two events and there is no reason for regarding either as earlier than the other, nor yet for regarding the two as simultaneous: Ideally careful observers will judge differently according to the way in which they are moving. This time is not cosmic but is to some extent individual and personal. This means that the data for our knowledge of physics are infected with subjectivity and it is impossible for two men to observe the same phenomena except in a rough and approximate sense.

The fact that an event occupies a definite amount of space-time does not prove that the event has parts. Events are not impenetrable as matter is supposed to be. Space-time order as well as space–time points result from the relations between events. This can be explained in a much better way by the following example.

Example of a King's procession.

Suppose, a King's procession is passing through a broad road. Those men who see the procession from the first street say that the procession has passed, the observers on the further street say that the procession is to come and for those persons who are sitting in the cars moving with the procession, the procession has neither passed nor it is to come. One and the same event is taken as a past event, the future event and a present event by observers situated at different places. Besides, if the observer in the first street for whom the procession has passed, runs to the second street where the procession is still to come, he can see the past event as a future event or it may be called a new event; and contrary if an observer of the second street runs to the first street to see the procession earlier, he can see the future event as a past event, and if any of these two observers Join the precession as servants of the King, the procession will continously appear as a present event. It is also possible to treat each of these events as a new event.

This and similar examples prove that time is not real. The mistake lies in taking our percepts to be the physical world. The new science says that the physical world cannot be identified with our percepts. The only way to find the truth is to correct the measure. When a man sees the world, there are always three elements viz the observer, his instrument of observation and the external world. In practical life, when the attention is concentrated on the external world, the first two are left out of consideration. Therefore there is no time left to reconsider the position of the observer and his instrument of observation. This is what happens in the dream condition. When the individual space and individual time of any particular individual are welded together, the individual is found to drop out altogether. The constituents are subjective to a particular individual but the product is objective. The relation between one man's space and time and another man's space and time or between the two spaces and times the same man may select for himself on different occasions is given in mathematical formulas of Einstein on which a good improvement has recently been made by Prof. Milne. The primary ingredients of nature are not objects existing in space and time but events in a continuum. An object which was formerly characterised by continuity of existence in time may now be treated as a continuous succession of events–each event being the existence of the field at one instant of time as experienced by a particular observer.

Einstein says that this universe of ideas is just as little independent of the nature of our experience as clothes are of the form of the human body. This is particularly true of our concepts of time and space. The circumstance that there is no objective rational division of the four-dimensional continuum into a three-dimensional space and a one–dimensional time indicates that the laws. of nature will assume a form which is logically most satisfactory when expressed as laws in the four-dimensional space–time continuum. Therefore what we see are not objects but events and every event creates its own space–time. The properties of the space–time continuum which determine inertia are regarded as field properties, (analogous to the electro–magnetic field) depending on the condition of the observer. This is as true in the waking state as in the dream state. This is also true when a man takes another birth.

Inertia (or **तमोगुण** of Maya) plays a very important part in the Science of Relativity and in the doctrine of Maya of the Indian philosophy.

Einstein says that the geometrical properties of the bodies are not independent but depend upon the distribution of masses.

The distinction of distance between one man and another man is a distinction of space. The distinction between those who are dead and those who are living is a distinction in time. As time and space have become relative, these distinctions can be altered if we know how to change the inertia or तमोगुण. Some of the modern philosophers have come to the conclusion that the same reasons which lead to the rejection of substance lead also to the rejection of things and persons as ultimately valid concepts. For instance, a man sees many things and many persons in a dream. Here events are due to the particular time–space division of the dream system. But when he wakes up and accepts the time–space system of the waking condition, all the differences of the dream are dissolved into one person's experience. Similarly, if one passes in the Absolute (Brahma) condition which knows no time–space divisions, the differences and distinctions of the waking condition are also dissolved. The impression from the whole is identical with the act of perceiving the whole.

An event is an act or karma. If an agent be necessary for an act, then an event must be taken as an agent–act i.e. as an occurrence which enacts itself and is not owned by any other actor. This means that all events or Karmas are personal. The event of which various manifestations are observed would seem to consist of as many acts as there are observations. Appearances are peculiar to each perspective i. e. an appearance is owned by its perspective and this ownership is not shared by another observer because no two observers see the events in exactly the same way.

Einstein says that time varies with different co–ordinate systems. An event as a single act is confined to the present. This is called समकालप्रतीति in the Indian philosophy. There is no acting in the past or the future, the past being already enacted, the future on the contrary being too indeterminate for action. The wonders of the time space as revealed by the theory of Relativity indicate that no experience can exhaust reality and that there is always room for alternative perspectives in which experience would take other aspects. If an event is taken as a bearer of such properties, it ceases to be a single entity because there are many sets of size, shape and date which it furnishes relatively to different stand–points of observation.

Supposing I have a pencil and I have mislaid it somewhere; I am searching for it and cannot find it although it may be lying in my pocket. It is not possible to find out exactly at what time I made the mistake, as it is not possible to find out exactly at what moment, the dream begins, or the sleep begins. Since there is no experiencing of the beginning and end of an experience, an event seems to be immortal. An experience of being unbounded in its very nature excludes measurement; it may be the essence of a physical event but it is its metaphysical essence. Neither size nor date which are variously determined by different observers should be taken as intrinsic properties of an event. The event of which various manifestations are observed would seem to consist of as many acts as there are observations. An event is essentially a space–time entity, being specified and distinguished from other events by its position together with its date.

If a man is looking at a lady, his attention invariably undergoes changes which brings forth some alteration in the sense datum and this is equivalent to saying that there is more than one perceptual event and therefore there is a process. Light moves in a straight line except in a field of gravitation, therefore space–time curvature appears wherever events occur. The space between two persons who love one–another or who hate one-another becomes curved and therefore we see the meeting of some persons and separation of some persons.

Events or acts are always described by dispositional characteristics,which are not manifested unless an observer is present. Each new observation gives rise to a new motive and the recognition of this motive in turn creates a new situation.

Pandit Jawaharlal Nehru has written a book "Discovery of India" when he was in the Ahmednagar Jail. In this book, he writes:—"Time seems to change its nature in prison. The present hardly exists, for, there is an absence of feeling and sensation which might separate it from the past. Even news of the active living and dying world has a certain dream-like reality, an immobility and an unchangeableness as of the past. The outer objective time ceases to be and the inner and subjective sense remains but at a lower level except when thought pulls it out of the present and experiences a kind of reality in the past or in the future. We live, as Auguste Comte said dead men's lives encased in our pasts but this is so in prison where we try to find some substance for our starved and locked up emotions in the memory of the past or fancies of the future."

☆

CHAPTER 2.

Nearest to Truth.

There is no religion higher than truth. But what is truth ? Truth is that which knows no difference, in other words, truth overcomes the otherness. We can realise the truth by right thinking, by love, charity and selfless actions.

In the beginning of life, we see the differences between one man and another man, between man and God and between man and the world. The new science of Relativity helps us very much to understand how differences are produced and how they can be removed. This theory helps us to understand that the events that we experience in the world have different time–space measures, according to the position of the observers. The most wonderful thing about the events is that although the events are not objective realities, they can be treated as objective realities. Einstein says that the laws of phenomena in the system of bodies for the observer who is connected with it will be the same, whether this system is at rest or is moving uniformly and rectilinearly. Eddington also says that the frame of time-space comes into our minds with our first perception of events. Shri Shankaracharya also says that काल तु कर्माङ्गं i.e., time is inherent in the event, or in other words every event creates its own time.

A good cultural life brings the future in the present. Historical progresss has no end. Cultural progress shows the end in the beginning It is the spatialising activity of the mind which generates multiplicity and it is the temperasing activity of the mind which creates sense of time.

Generally, a human observer does not know that what he sees is an appearence. It is only at a very advanced stage of knowledge when he compares his viewpoint with the viewpoints of others that he begins to realise that all events are appearences. Very often when a man sees the world, his attention is so much directed towards the world that he fails to understand his relation to the world. In social service, very often a man tries to improve everyone except himself. In the physical science also, before the coming of the theory of Relativity everyone studied the world and not the observer of the world. If we do not take the observer into consideration in our observation of the world it would be like missing the husband in the marriage of a bride and when we take the observer into consideration, wonderful results are obtained some of which are recently brought to our notice by the theory of relativity. Up to the 19th century, science was studying the nature of the physical world. In the twentieth century, the new science has commenced to study the nature of the instruments by which we obtain the knowledge of the Universe. Let us now take up some examples to find out the wonderful nature of the instrument of measurement.

Example 1

Here is a chair, you can measure it by a foot rule. This is a three dimensional chair and three dimentional objects are measured by foot. Now let us take the observer of the chair into consideration. Supposing a four or five years young child comes to sit on the chair. He will find the chair so high that he will either have to jump or he will have to ask some one to help him to sit on the chair. Supposing now that the chair is lying there for 25 years. In the meanwhile, the child grows up to 30 years. He comes back to the room and finds the chair very low i. e. quite low for him to sit thereon. In the early childhood, he had found the same chair very high. Which chair is true ? According to the new science, the chair which was seen by the child in the early age was not an object but an event, and at the age of 30, the chair that was seen by him was also not an object but an event. Here we have taken into consideration (1) the observer (2) the instrument of observation and (3) the chair. There has been no difference in the chair as an object but there is a great difference if we take the chair as an event. Similarly in the case of the room in which an elderly man is sitting and in which a child is sitting, if we take into consideration the method of observation, the same room appears larger to the child. If the child in the advanced age comes back to see the same room, he will observe that the room has become smaller. As a matter of fact the elderly man was sitting in his room and the child was sitting in his room, or every one lives in his observed world. All such incidents are events and not objects.

Example 2

Let us now try to ascertain whether the earth is moving round the sun from west to east or whether the sun is moving round the earth from east to west. In the year 150 A.D:, Ptolemy said that the sun was moving round the earth. Afterwards, in the year 1547.

Copernicus came forward and he proved by several experiments that the earth was moving from west to east. As we are moving with the earth we see the sun going from the east to the west. That is the astronomy ;which is now being taught in the high schools and colleges.

But, if you ask the new scientist who has studied the theory of Relativity, as to what is moving, whether the sun or the earth, he will ask you the question, "find out first the condition of the observer". If the observer is on the earth, the sun will appear to be moving and if the observer is on the sun, the earth will appear to be moving. The body on which the observer is standing will not appear to be moving. Motion has now become a relative thing. The present scientist will not say which is moving. The old attitude has been changed. There are no objects now left in science. They are only events and in finding the truth of events, you will have to take into consideration, (1) The observer (2) his instrument of measurement and (3) the external world.

Applying this example to philosophy, if we are one with God, we shall not be able to find out the creation in God. If we are a little seperate from God, then we shall be able to see the creation of God. but we shall not be able to understand it as every body's vision is different. In the example given above, if we are a little away from the earth, we shall be able to see the motion of the earth. This example can be applied as above also if we want to see all the activities of God.

Example 3

If two observers are near each other, they can, of course, look at each other's watches and compare them. If they are far apart they can still compare each other's readings by means of signals.

Suppose that there is one observer on the sun and another on the earth and they wish to compare their measurements of time.

Let us imagine that by his own watch the observer S (on the sun) sends a message to observer E (on the earth) which reads 12 o'clock; E receives the message, say 8 minutes later. Now if his watch agrees with that of S, it will read 12–8 when the message arrives. E then sends back to S the message 12--8 and of course E receives the message 8 minutes later viz-at 12–16. Thus S will conclude from this series of signals that his watch and that of E are in perfect agreement.

But let us now imagine that the entire solar system is moving through space; so that both the sun and the earth are moving in the right–hand direction without any change in the distance between them as follows: S E Now let the signals again be sent as before. S sends his message of 12 O'clock, but since E is moving away from the message during those 8 minutes, the message will not reach E in 8 minutes but will take some longer time to overtake E, say 9 minutes. If E's watch is in agreement with that of S, it will read 12-09 when the message reaches him and E accordingly sends a return message reading 12-09. Now S is travelling towards his message and it will therefore reach him in less than 8 minutes say in 7 minutes; thus S receives E's message at 12-16 just as before. Now if S and E are unaware of their motion (and indeed we are undoubtedly moving in ways that we are entirely unaware of, so that this assumption is far from being an imaginery one) S will not understand why E's message reads 12-09 instead of 12-08; and will therefore conclude that E's watch must be fast;of ourse,this is only an apparent error in E's watch because as we know, it is really due to the motion and not at all to any error in E's watch. It must be noted, however,that this omnicient "we" who can see exactly what is really going on in the universe does not exist and that all human observers are really in the situation in which S is viz that of not knowing about the motion in question, and therefore being obliged to conclude that E's watch is wrong. And, therefore, S sends E the message telling him that if E sets his clock back one minute, then their clocks will agree. Another result of this experiment will be that owing to the motion, there will be a difference in the distance between the two bodies; yet each observer is right from his own point of view.

Recently an improvement in the above method has been suggested by Prof. Milne. He says that before taking second observer's clock into consideration, the first observer's clock should be regulated by considering the following three points viz:—

(a) The first observer can note the instant by his own clock at which he kindles his light.

(b) The instant (by his own clock) at which he perceives the second observer.

(c) The reading of the second observer's clock at the moment it becomes visible.

He has thus made three time observations and these must be unified. Prof. Milne says that the only events which an observer actually experiences are events at himself.

The Science of Relativity has been able to prove by mathematics that time, length and mass of an object are not facts but rather relations between the object and the observer. In practical life, one man tries to correct the mistake of another man and vice–versa but when truth is known, each one may be right from his own point of view at the time when the judgement is made.

Example 4

During the period of the second world war, the then Viceroy of India had ordered one hour's change to be made in all clocks in India. This change lasted for about three years. But it had produced so much effects on the habits of the people, that several persons said that they were feeling hungry according to the new time and they were getting sleep also according to the new time. When we are happy, we feel that time passes quickly. When we are suffering from some pain, time does not pass quickly. In sound sleep, we have no events and therefore we do not get any experience of the passage of time. Every one is at a different stand–point of experience and therefore must be content to live and let live without resentment, criticism or self-pity, remembering that this is an essential part of the Divine play. Wars take place when the leaders of one country think that their own stand-point is the only correct one but this is a mistake.

Example 5

We experience days and nights because we are living on the earth but if we be living on the sun or on the moon, there will be no days or nights. When a steamer goes from Bombay to London, all the clocks in the steamer have to be changed every morning. If the timings are not changed, there will be a difference of about 5 hours when the steamer reaches London, and the Bombay travellers will not be able to do any work in London according to the Bombay time.

Example 6

One man got three dreams at night. When he woke up, he heard the second stroke of 2 A.m. Before the dreams commenced, he had heard the first stroke of 2 A.m. During the interval of two strokes, he had an experience of three dreams. This shows that dream time is different from the waking time.

Example 7

In the dream condition, time and space change in a very wild manner. One man sleeping in Bombay goes to Calcutta in dream. He sees in the dream, riots having taken place in Calcutta and wants to return to Bombay. He does not get a ticket at the station; besides, the journey takes about two days but if he wakes up, he is in Bombay in a second. When the condition of the observer is changed, entirely new phenomena begins to be experienced. We have now to consider not distances between objects but intervals between events.

Example 8

Suppose we have ordered for a Taxi to go to the station. The Taxi has not arrived and we begin to walk towards the station thinking to use the Taxi wherever available. In such circumstances, the distance to the station changes at every second. In other words, every event creates its own time.

Example 9

There are many local stations in Bombay. Supposing a Local train is going from Church gate to Dadar. Dadar station is in future to the driver. But if an aeroplane is flying overhead, a man siting in the plane can see both the stations in the present time.

What is future for the driver is present to the pilot of the plane. The pilot in the plane has got Karachi in the future but if there is an observer on the sun, he will see both Bombay and Karachi in the present time.

Example 10

While remaining on the Earth, we see that trains are moving and the stations are not moving but if we go to the sun, we shall find that both the trains and the stations are moving because the whole earth is moving round the sun from west to east.

Example 11

When two persons are sitting near each other and if they are hating each other, we say that there is a great distance between them. In that case the space between them becomes convex and in a short time they become separate from each other. If two friends see one another from a distance, the space between them becomes concave and in a short time they come to meet each other. In short, the space between two persons is created at the time of perception and changes according to the nature of the perception.

Example 12.

In a dream, one man sees hundred persons. Including himself there are 101. When he wakes up, there is only one person. The dream number 100+1 has been reduced to one. How did he get so many persons in his dream and why he took only one body as himself and hundred as not his self? who created the space between them? It is evident that dream-space and dream-time have been created by the dream--observer. The dream space and the dream time do not begin before the dream begins. Similarly, the space and time of the waking condition also do not begin before the waking condition begins ,and it can be assumed that the time and space of a man newly born do not begin before the new birth begins.

Example 13

In India, the Christian callender is still accepted as true for all practical purposes. But suppose the Indian Government decides to start the Hindu Callender year which is now 2006, and Pakistan Government decides to begin their Hijri year which is now 1367. Hindus belive in rebirth. If a Hindu dies in Bombay in the year 2006 and is reborn in Karachi in 1367, he will begin his life in the year 1367 and he will not be able to know how and why the time has gone backward. This wonderful arrangement of time-space measure requires to be carefully studied.

Example 14

The theory of evolution has lost all its force because it is based on one uniform time. One book by name "Evolution disproved" has been published in America. Its author has given 50 reasons, one of which is that as the theory of Relativity has destroyed one uniform time, evolution cannot be proved as a sound doctrine.

Example 15

In Bombay, people are accustomed to use two times viz. the Bombay local time and the standard time which is followed by the Railway Dept, the Postal Dept., and Government offices etc. Calcutta has also got its own local time. The theory of Relativity also says that all times are local times. But for practical purposes, we create one common time.

Example 16

The planet Saturn has got a day of 10 hours, planet Mercury has got an orbit (year) of 88 days. Naptune's one year is equal to our 164 years. The Planet Mars has got two Moons, one of which creates a Lunar month of 7 days.

Example 17

We think that we are sitting at one place but the Earth is rotating round the Sun at the rate of 18 miles a second. An observer on the Sun will see us fast moving at this rate.

Example 18

In the dining car of a moving train, a man is taking his meals sitting at one place but as the train is moving, he is not taking his meals at one place as seen by another observer who is not in the train. The frame of space comes into our minds with our first perception of space.

Example 19

When we are travelling by a train and sometimes when we happen to pass reversing stations at night, we get confused about the direction in which the train is moving when we wake up.

Example 20

A dog dees another real dog in a mirror. A sparrow also sees another sparrow in a mirror. An owl sees darkness in full day-light. The world of a two dimensional being cannot be measured or properly understood by a three dimensional being and the world of a four dimensional being also cannot be understood by a three dimensional being.

Example 21

When a man is in a sea voyage, he some times gets sea-sickness. This is due to his getting experience of three kinds of spaces. Viz. One space (of the earth) is left at the shore, another curved space is experienced on the waves of the sea and the third space is seen, in the steamship in which he is apparently sitting although from another point of view he is moving.

Example 22

From the ground, we see the top of a mountain, but when we go to the top of the mountain, we do not see the top; we rather see the bottom. Perception in itself does not reveal the true character of objects.

Example 23

If a Railway train is going from one station to another near station and the driver, seeing a cow on the rail-road gives a continuous whistle, the pitch of the whistle is heard by the coming station master as gradually increasing, and is heard by the past station master as gradually decreasing, whereas for the driver of the train, the sound is neither increasing nor decreasing. Thus, difference in time-space measurments gives different views of one and the same event.

Example 24

We generally say that that the sun rises or that the sun has set, but neither does it rise nor does it set, It appears to be rising and setting in the eyes of those who are on the earth. This means that objects in space moving with different velocities build up different time-intervals.

Under the erroneous idea we form of the past and the present, a new verity is living and moving, eager to come to light. The effort of this verity strikes to the very roots of history. Before and after overlap and mingle. We cannot separate the years that have gone by from the years that are to come. We discover with uneasiness that time on which we base our whole existence itself no longer exists. Yesterday, recently, formerly, earstwhile, after, before, tomorrow, soon, never, later, fall like childish masks, whereas to-day and always cover with their united shadows the idea which we form in the end of a duration which has no sub-divisions, no breaks and no stages, which is pulseless, motionless and boundless. No complete view can be obtained so long as we separate our consciousness from the world of which it is a part.

It is a one-sided view which takes the environment to be all important and the conscious spirit to be unessential. The boundary conditions are not the objective facts but the knowledge we happen to possess about them. The idea that perception in itself reveals the true character of objects is a fond delusion and one which it is very necessary to overcome if our philosophy is to be anything more than a pleasant fairy tale. The only way to get clear is to make a fresh start with events instead of with bodies.

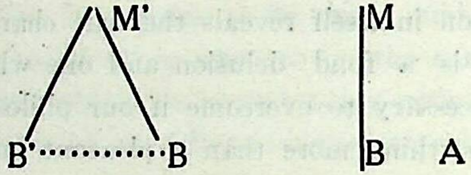
Example 25

We say that it takes a long time to go from Bombay to Calcutta, long as compared to what ? Long perhaps as compared to the time it takes to go from Bombay to Nagpur or long as compared to the mind of a traveller who is continuously travelling by plane. We say that the High Court of Bombay is very high, high compared to a smaller building but it is low compared to the Rajabai Tower.

Relativity teaches that the forms which time and space take are never final. They are aspects which may alter in the wildest manner.

Example 26

One event which takes one minute on one planet would not take one minute on another planet. Consider two bodies in space, say, the planets Venus and the Earth with an observer B on Venus and another observer A on the Earth as follows:—



B notes the time taken for a ray of light to travel from B to distance M. A on the Earth has means of observing the same event. B records one minute. A is puzzled for his watch records a little more than one minute. What is the explanation ?. Granting that the two clocks register the same time to start with and assuming further Einstein hypothesis that the valocity of light is independent of its source, the difference in time is due to the fact that the planet Venus moves with reference to the observer on the earth so that A in reality does not measure the point B M but B M' and M' B' where B B' represents the distance. Venus itself has moved in the interval. And if any one puts himself in the position of B on Venus the situation is exactly reversed. All this shows that what is a certain time on one body in space is another time on another body in space. There is nothing definite about time.

Example 27

If when you are going away on a long and continuous journey, you write home at regular intervals, you should not be surprised that with the best possible mail service, your letters will reach home at progressively longer intervals, since each letter will have a greater distance to travel than its predecessor. If you were armed with instruments to hear the home clock ticking, you will find that as your distance from home keeps on increasing, the interval between the successibe ticks (i.e. its second) grows longer so that if you travelled with the valocity of sound, the home clock would seem to slow down to a stand-still and you will never hear the next tick.

Precisely the same is true if you substitute light rays for sound waves. If with the naked eye or with a telescope you watch a clock moving away from you, you will find that its minute hand takes a longer time to cover its five minutes interval than does the chronometer in your hand and if the clock travelled with the velocity of light, you would for ever see the minute hand at precisely the same point. That which is true of the clock is, also true of all time intervals which it measures so that if you moved away from the earth with the velocity of light, everything on it would appear as still as on a painted canvas. Your time has apparently come to a stand–still in one position and is moving in another. All this seems absurd enough but it does show that time alone has little meaning.

Example 28

In the motion picture, each photograph by itself conveys a sensation of space of three dimensions: but one photograph rapidly following another, conveys a sensation of space and time together i. e. of four dimensions. Space and time are interlinked.

These illustrations indicate that objects in space moving with different velocities build up different time intervals. Thus the velocity of the star Arcturns, as compared to the earth moves at the rate of 200 miles a second.Its motion through space is different from ours.

Example 29

One man does some work more quickly than another man. Therefore in some factories, wages are paid according to the work turned out. Here there is no objective time. Time depends on the worker.

We are generally domnated by the events in which we take part. Their proximity, the fact that we are actors in a drama warps our perspective, prevents our embracing the phenomena as a whole and attributing to each event its relative value. We make our space–time measurements of position and motion in relation to some standard which we assume is permanent, unalterable and immutable. But Einstein has convincingly demonstrated that there is nothing in the universe to which we can apply the description of rest. We habitually judge by plausible outer appearances, by what our limited five senses tell us and commonly but ignorantly take solid stones for matter at rest. Yet the truth is plainly revealed by modern physical investigation into the wonderful world of atoms and molecules. For the whole of stationary matter is built up out of electrons and protons and neutrons which are incessantly moving like swarms of restless bees. Therefore, we must revise our simple notion of the world.

Relativity shows that we have got to alter our inherited habits of thinking about the world. Space and time demand examination because they enter into every conception of the external world. They are the forms in which our experience is given us. A complete understanding of this world completely involves these two. Our objective life on earth obviously moves within the conditions imposed upon it by space and time and all our experience is indeed inseperable from them. All measurable bodies and all living creatures are presented to our senses as existing spatially and temporally and we cannot help representing the entire universe to ourselves within a specific frame of space and time. But the meaning of the latter is always relative and changes with changing circumstances. If we change our frame, we shall change familiar characteristics of our universe too. It will lose its fundamental fixity. There can be no such thing as unique spatial relation or unchangeable time observation. So far from being a property of the external world, space and time begin to appear as mysterious and wonderful subjective elements which condition our perception of the entire external world.

Our confidence in dating a single event is shattered when we learn that it will be seen at different times by two observers who are placed on bodies with different rates of movement; we start in surprise on hearing that two events which are simultaneous in occurrence for one observer will appear to have a lapse of duration between them for another observer

Relativity teaches that the forms which time takes in experience are never final. They are aspects which may alter in the wildest manner. In the next chapter, we shall try to see how our instrument of measurement changes from childhood to manhood.

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CHAPTER 3.

From Childhood to Manhood.

The Science of Relativity has proved that what we see, are not objects but events. If this is so, how did we get the knowledge of objects from our childhood?

Before a child is born, it is difficult to know what kind of knowledge it possesses. Evidently it has not yet entered the human world, it is in a different system with different kinds of time-space co-ordinates. It is a question for the biologists to investigate. Two good scientists have made an attempt to find out the condition of the child before birth. Professor Erwin Schrodinger of the Dublin University has published the result, of his researches in his famous small book "What is Life", (published by the Cambridge University Press), and Professor J. J. Asana of the Gujarat College, Ahmedabad, who has spent a large part of his life, for research, in this direction, has published the results of his research, in several scientific Journals. Professor Schrodinger gives the following two propositions:—

(1) My body functions as a pure mechanism according to the laws of nature.

(2) Yet I know by incontrovertible direct experience that I am directing its motions of which I foresee the effects that may be fateful and I feel and take full responsibility for them. The only possible inference from these two facts is, I think, that I–I in the widest meaning of the word, that is to say, every conscious mind that has ever said or felt 'I'' am the person if any, who controls the motion of the atoms according to the laws of nature.

How does the idea of plurality arise at all from the beginning of life ? Schrodinger answers that consciousness finds itself intimately connected with and depedent on the physicals tate of a limited region of matter, the body. Now there is a great plurality of similar bodies during the short life time. Hence the pluralisation of consciousness or minds seems a very suggestive hypothesis. This leads almost immediately to the invention of souls, as many as there are bodies, and to the question whether they are mortal as the body is or whether they are immortal and capable of existing by themselves. The former alternative is distasteful while the latter frankly forgets, ignores or disowns the facts upon which the plurality hypothesis rests.

Schrodinger warns us against declaring the souls to be perishable or annihilated with the respective bodies, and says that the only possible alternative is simply to keep to the immediate experience that consciousness is a singular of which the plural is unknown. Thus there is only one thing and that what seems to be a plurality is merely a series of different aspects of this one thing, produced by a deception (the Indian Maya).

This Maya is of two kinds, the Maya of attraction and repulsion (राग and द्वेष) and the Maya of time– space (देश and काल). It is easy to understand the first kind of Maya, but it is difficult to understand the second kind of Maya. In this book an attempt is made to explain the time–space Maya.

Physically speaking, the particles of the male fluid which enter the female body gets heat of the female body and then begin to develop into a body, which then acquires a certain kind of intertia suitable to the environment. It is known to the chemists that the same group of atoms can unite in more than one way to form a molecule. Such molecules are called isomeric. While remaining in the female body, it is difficult to avoid the consciousness of a body. This bodily consciousness continues after the birth of the child and for many years even upto the end of life. This consciousness creates a separation between one man and another man. Although the physical body undergoes several changes, the inertia of the system continues. On this basis, an Astrologer first finds out the time and place of the birth of the child and then prepares from the date of birth available his intertial system and how his life will progress in future. This future can be changed only when the man is able to change his inertial system by transcending the old physical consciousness and acquiring new spiritual consciousness. Generally a child lives in the present. It is interested in the things, but not in the time relations between them. But the consciousness of time is thrust upon it when it is obliged to wait for a desired object. Then duration or time is perceived. While the child remains in the midst of human beings it cannot but imitate human feelings and human behaviour. It is sucking not only the milk of the mother but is continuously sucking orderliness from its environment. When the child begins to see the world, its visual perception is not concerned with the act of perception, its interest instead lies in the objects preceived. This object informs the child of surrounding objects and enables it to adjust its movements. It is only in cases of error that the attention of the observer is turned from the object perceived to the act of perception. Generally a child begins its life with feeling and feeling does not necessarily involve consciousness. It is only at a very late stage, (generally in youth) that the consciousness begins to develop. In the early age, a child is more dominated by its environment (प्रारब्ध), and this gives the idea of the uniformity of nature.

But freedom has a different meaning. A free man is not dominated by his environment. God is free because He is not determined by anything outside Himself. That thing is called free which exists from the necessity of its own nature alone and is determind to action by itself alone. That thing on the other hand is called necessary or rather compelled, which by another is determined to existence and action in a fixed and prescribed manner.

If this definition is true, then a child is not free, a man in a family is not free and national politics also do not give freedom. Many human beings have not yet reached the age of reason and their efforts are still on the scale of tribe. A child's virgin mind is a soil for the development of any idea right or wrong. This principle applies also to those grown up people who have not developed consciousness. The information furnished by our senses is imperfect, relative and only covers an infinitely small portion of our universe. If a man wants to dominate his environment, he must have true consciousness and this will arise only when he will learn to dominate his senses.

When a child is born, it does not know that it is born, it does not also know anything about the human world and human relations or if the child has any knowledge, it is not similar to the knowledge of a young man. After some time, the newly born child is given a name but the child is not then aware of it. Gradually it begins to accept that as its name. Can we find out exactly at what minute in his life, the child gets the idea that it is born ? This is not possible. Why ? It will be explained in the following pages. In the early age only senses begin to be developed. Sense perception is a form of consciousness in which the subjective side is so much reduced to a state of passive awareness that the subject is thrown out of the field. As a lion in a circus is being tamed to dine and play with goats, so a child is trained by elders to behave like man. The child accepts the man-sized world as a true world. Gradually ego appears and dominates the life of the child. Upto this stage subjective psychic life is not developed, and its consciousness is at the mercy of the sense-objects. Practically no inner sense can be said to exist where the higher forms of intellectual activities are absent. If primitive man was a victim of illusion of animism, modern man easily becomes a prey to the opposite illusion, making sensual presentativeness or interpretation in terms of the outer reality, a criterion of reality as such.

When the child grows up, it becomes aware of its relatives. Relatives give him a relative knowledge which he accepts as correct. If he has an uncle, he becomes a nephew, if he has no uncle, he is not a nephew. Suppose, the age of the child is about 5 to 6 and his name is Kantilal. One such child went to see the marriage of some of his relatives. After seeing the marriage, he asked his father why he could not see his (father's) marriage. Upto this age, the young child has no idea of what the marriage is like. Marriage is an event which belongs to a different state of consciousness to which the young child has not yet developed. Every stage of development or every state contains a consciousness suitable to that age. After some time i.e. when Kantilal was about 7 years of age, his mother gave birth to another child in a hospital. Kantilal, then, thought that his mother brought a young brother for him from the hospital. Kantilal even advised some of the young children of his neighbours' to ask their respective mothers to bring brothers for them from the hospital. Birth and death are events of which the young children practically know nothing. Elders also know very little about the truth of these two events. At the age of about 12, Kantilal saw the death of some old person. He asked several persons as to where the dead man had gone but no one could give him a satisfactory answer. A young man begins to take experiences of this world with the help of his five senses but the five senses do not give him correct knowledge. The earth is round but appears to be flat, the sun is larger than the earth but appears to be very small; sometimes, he sees a serpent where there is rope only. Therefore a man is often deceived in accepting the evidence of the senses. The present self which is limited by the experiences of the senses is only a projected part of the whole self. It has only a physical consciousness.

This is a consciousness which considers the bundle of the body and the senses as the self.

In this condition, it is always the object focussed which occupies the dominent place in the light of consciousness. The cognitive, assimilative and reactive functions playing around this object are more subjective and consequently more dimly illuminated than the object. When consciousness is functioning as a passive awareness, it is leaning on the body.

Once Kantilal began to see his body in a mirror and he found the following wonderful results:—

1. While he was looking at the mirror in the east, the image in the mirror was looking at the west.

2. He was a three-dimensional being whereas the image was two dimensional.

3. He moved his left hand and the image in the mirror moved its right hand.

4. If the mirror is concave, the body appears to be curved.

What are all these experiences due to? Kantilal began to think over those events again and again.

After some time, he left off his childish games and went to school for study. There, he began his study of history. This study does not give a right knowledge. It begins abruptly at a certain period and is finished without showing us the beginning and end of all things. It contains a uniform man-sized time which is only relative as shown in the previous chapters. Supposing we were born 200 years earlier, we would have learnt a different kind of history. Besides, every nation considers that its country is always in the right and enemy country is always in the wrong. This is history as is being taught to the students in the high schools and colleges of different countries. But when consciousness develops, one finds that time does not have the same value for a child as for a grown-up man. It has also not the same value for every man and for a scientist or a philosopher. In the school histories, we hear of treaties, signatures, understandings, connections, courts of arbitration but we seldom notice the respect of these treaties and signatures, without which these instruments lose their value.

If human history is not properly taught, what about the reality of the time-sense on which the whole history is based? What was at the beginning of the world? who was the first king of the world? if Kantilal has a father and if his father has a father, who was the first father and how was he born? These are questions relating to the truth of true history but very few people are able to answer them and very few are able to understand them. The self as an object of the passive inner sense is only the self of the movement. But in active intuition this self is only considered as a passive phase of a deeper subjective self–transcending time–process. By the active aspect of consciousness is meant its ability to rise above the human time–process, liberate itself from it, adjust itself to it and judge about it. This means a different scale of observation. This process is called intuition. It is an active inner awareness of the nature or even the essence of the sense object. The development of intuition brings some unrest in the knowledge given by our senses,

Newspapers generally give information about the events relating to share–bazzar or love matters or about the political matters. They do not teach us the philosophy of events. If a man is sleeping in a train, he is unconscious of the passengers coming and going, of guards and drivers changing at various stations. Therefore, there is no event unless an observer is there to see it. One student in a class was not giving proper attention to his study of the history. His teacher asked why he was careless about it. The student replied that he wanted to make history by becoming a great political leader. Histories of nations are made by men and learnt by those men who like them. Philosophers like to learn histories of saints or their cultures rather than the history of politicians. Real history is that which shows us the truth about God, and the universe. Man is not a political being. A man's life should not be completed only in learning a political history. We have got in India two great historical works viz. the Mahabharat and the Ramayan but they contain more information about cultures than about politics. The histories which are now being taught in the schools and colleges contain more information about politics than about cultures. A true history of Swaraj is that which teaches us how to know Swa (स्व) or soul. It cannot be taught by those who have not got that experience.

Let us now consider the geographical study taught in the schools and colleges. It means a study of space. We know about the continental boundries of our earth or get some information about the heavenly bodies but what is beyond that ? If there is empty space, who has created that space and where is the end of that space ? Modern science shows that space and time are dimensions, they come into existence with our first perception and according to the nature of the perception. They are not facts but relations. In one large room, one man may be sitting and a parrot may be flying therein. Both are not in the same room. The parrot finds the room suitable for flying whereas a man finds the room suitable only for sitting. If the man dies and becomes a parrot he finds the same room of a different nature. Present science says that the universe is finite though unbounded. This means that as long as any observer is connected with any system he is bound by the laws of that system but if he can transcend that system, he becomes free and goes into a new time–space continum suitable to the new system.

If somebody is born in Germany and then goes to live in America and if he is afterwords certified as an American citizen, his country changes. This shows that space is relative, and countries are man–made.

Now let us assume that the student Kantilal begins to learn grammar in his school. He learns that the plural of I is "we" but this is not true. In "we", he has to include thou, she, it, he etc. I is a singular pronoun of which the plural is not traceable, therefore, there is one "I" in the world and that is the true soul. But the I which through ignorance identifies itself with one body, calls the opposite I as thou. Supposing Kantilal gets a dream and therein he sees 100 students, the total including himself comes to 101. When he wakes up, there are not 101 but only one. In dream state he had taken one body as his own out of 101, although all the bodies belonged to him. In the waking state also, as stated adove, the I is one in all the bodies but through ignorance, a man takes one body as his own. Who created the empty space between 101 persons in the dream and who has created the empty space between different persons in the waking condition? According to the modern science, space is created by the observer at the time of perception. Sociality is compatible with physical independence of different attitudes towards one self precisely because the social agent takes all of them except his own in imagination (as in dream so in the waking state). He does not actually disintegrate into a multiple being because the imaginative attitudes are only supplementary appendices to the single physical attitude connected with the state of his body. But an event which is physically split into several perspective agencies is a group and not a single event. Further more, it is not a unified group but a mere multiplicity of appearances. From this point of view it may also be called a single event, as in dream, so in the waking state.

Now we assume that Kantilal begins to learn arithmetic and geometry. In learning geometry, he has to draw a straight line. He calls it a straight line but if the straight line is prolonged to 25000 miles, it will become a curved line, because the earth is round and its circumference is about 25,000 miles. Generally three angles of a triangle are equal to two right angles but if the triangle is drawn on a sphere, the three angles are not equal to two right angles. It has now been discovered that geometry depends on the space–time and space–time depends upon the system of reference. The present physical science draws four dimensional figures. We used to learn in the high schools that parallel lines do not meet, but if the space changes, parallel lines can also meet.

Newton said that object cannot exist without space. Einstein says that space cannot exist without objects. Newton said that events cannot exist without time. Einstein says that time cannot exist without events. Present physical science has changed objects into events by including the observer and his instrument of observation in the system under consideration. Therefore, what we see is not the world but some kind of our relation with the world. This matter can be more clearly explained as follows:—

Supposing there is a painter and we ask him to make a drawing of everything that is lying in a room. The painter starts his work and finishes it according to the instructions given as follows:-

room painter.

After seeing the picture, he gets an idea that he is also in the room. Therefore, the painter should also be included in the paintig. He draws another picture as follows in which the painter is included in the painting.

Room
painter
observer.

He now observes as an observer that the painter has been included in the painting. This picture shows the relation of the painter with the room. If there would be a monkey in the room, he should ask the monkey how the room appears to the monkey and change his painting accordingly. But as it is not possible to find out from the human point of view how a monkey can see our world, the new painting cannot be drawn but it can be easily imagined, that no two observers see the same thing in the same way, yet, each observer may be making a true statement of his time-space world according to his measure of observation. If any man has eyes similar to the X-Rays, he can see the inside structure of all the bodies and he can see the valuables lying in an iron safe. In ordinary affairs also, it is easy to understand that a child does not see the same thing in the same way as an adult person, males and females are also living in different worlds and so also the world of the poor is not similar to the world of the rich. America and Russia are also not living in the same world because they have different ideals.

Our struggle in life is not merely between morality and immorality but also between knowledge and ignorance or between one kind of knowledge and another kind of knowledge. As the problem of food and sex are important in human life, so the problem of right knowledge is also important.

Supposing a man has got only 4 senses instead of 5. A blind man goes to Bombay but cannot see the various things which other persons are able to see. The blind man cannot enjoy the beauties of sun-rise or a sun-set. If he is also deaf, he cannot enjoy the various tunes and words. If he is placed in a cinema, he can neither see anything nor can hear anything. For such a person, the cinema-world does not exist. If he has a stick in his hand, where his stick touches, that is Bombay for him. He is living in a world which is very different from the world in which men with five senses are living. Now we take into consideration the experiences of two dimensional beings. Supposing some ants are moving on my table and I place my five fingers there on. The consciousness of the ants will give evidence that five beings have been born in their world. If I now raise two fingers, the ants will say that out of the five beings, two are dead. But the evidence of the three dimensional human beings is different. For them, five beings are not born and two are not dead. Similarly, if some one by some Yogic practice begin to live in a four dimensional world, he can see where Mahatma Gandhi is how living. But that is only an assumption based on the calculation that the four-dimensional psychic world may be similar to our own. When a man rises to a higher dimension, his knowledge undergoes so much change that there is nothing common between a three dimensional human being and the four-dimensional superman. The higher ideals demand a purification and metamorphosis of the lower impulses, leading to a sort of spiritual resurrection of the man of the flesh. When time as a fourth dimension is co-ordinated with the three dimensions of space, we get a space-time world in which every point is considered as space-time point or world-point. In these circumstances, the difference between the spatial point and the time disappears. It is really not a space-time word but a world of one dimensional continuities determinable by four or more co-ordinates. Intuitionally space and time are relative to the observer i. e. they vary with the subjects and the systems to which they belong. In other words, the distances observed by measurement between two points in space or two moments in time are not invariable but dependent on the stand-point of the observer and his state of motion. The higher dimension for a being unable to rise above it in active intuition and construction, will present itself to it as a time succession, which for a being able to transcend it, will appear as a continuous whole.

Creation of the world is not possible without time and space. Modern science has proved that time and space are not parts of nature but are parts of our observation of nature. Time and space cannot exist in God, otherwise, there would be parts in God. They are mysterious elements like Maya which cannot be described. One good writer Ushenko writes in his philosophy of relativity that there is no self-experience of limits of duration because no event outlives itself, and it is only through self-surviving that it could comprehend its boundaries of time. Since there is no experiencing of the beginning and end of an experience, an event feels immortal. But an experience of being unbounded in its very nature excludes measurement. It may be the essence of a physical event but it is its metaphysical essence. Besides, when an event is taken as a bearer of infinite properties, it ceases to be a single entity because there are many sets of size, shape and date which it furnishes relatively to different stand-point of observation.

Let us now take up for consideration the event of death. When Kantilal grew up, he began to think about the problem of death. He asked several persons as to what was death and what happens after death but no one could give him a satisfactory answer. A man who is dead does not say that he is dead. If he has gone to some place, how can he be called dead. An embodied person while living goes from one place to another place, therefore, he thinks that a man must have gone to some other place after death. This is an event which has relation to an embodied person. But if he can get an experience that he is the soul and not the body, he is neither born nor does he die. Everything depends on which of the two horses he is riding i. e. whether he thinks himself as an embodied being or whether he is a spirit. In order to find the truth of such event as death etc. a man should be able to go beyond human feelings or in other words he must transced the conceptions of the human time and space.

Let us consider one event about the morning. When does morning begin? Some say that it begins when the cock crows, others say that morning begins when the sun rises, some say that morning begins when we wake up. If one has not awoken when the sun appears, there is no morning for him. The morning of the railway ticket venders begins after twelve o'clock at night. In Japan morning begins earlier than in India. American people experience their morning earlier than the Japanese. Thus difficulty was experienced from which place a date should be altered. To avoid this inconvenience, all the nations jointly agreed and made an international date line near Japan. After this time, Japan and India are called Eastern Nations and Europe and America are called Western Nations. But these are not facts. They are imaginary divisions made for certain human purposes. If the Bombay train starts from Bombay at Bombay time and reaches Nagpur at Nagpur time and reaches Calcutta at Calcutta time, it will not be possible to fix any time-tables and there would be a chaos; therefore, for the convenience of the public, the Indian Government has fixed one Standard time. There are many instances of this nature. The same mail train going from Bombay to Calcutta is called Calcutta Mail in Bombay and is called Bombay Mail in Calcutta, These names are given for the sake of convenience. The Standard time is fixed also for the sake of convenience. It is not a true time. The Science of Relativity has proved that there is no true time. Each moving body possesses its own standard of time and its own system of space with which an observer will always be in relation. He will not know ordinarily that other standards and systems may differ from his and that if he persists in sticking to the latter, he will be unable to explain the presence of utterly incomprehensible and completely irrational factors in the Universe.

Once I was going in a bus from one place to another in Ahmedabad. Near the Gujarat College, 10 students entered the bus. The ticket vender asked for tickets. One student began to count their number, he counted 9 and asked for 9 tickets. The ticket vender said that you are 10. Then another student counted their number again and the number was found to be 9. The ticket vender counted again and the number was found to be 10. Then one student said that our mistake lies in not counting the counter. Then tickets for 10 were purchased. Similarly, a social worker often wants to improve everyone except himself. Physical Science upto the ninteenth century also failed to notice the position of the observer in studying the outside world.

In psychology also, we can only arrive at truth if we take the condition of the observer in consideration. Time and space cannot be comprehended in their true relation, when they are considered apart from the subject and its psychic life. In the sphere in which we are partaking in sensation, we are obliged to move about to obtain the objects of sensations we desire; but in the sphere of presentation, we do not need to move our limbs to realise the desired imagination and memories. We will have no consciousness of space if we are incapable of self movement in it, and we will be unconscious of time, if we were incapable of a similar self-movement in it by virtue of associative memory. Therefore, if we do not learn history, there is no time process for us, and, if we do not move about very much, there is no geography for us.'

Sri Raman Maharshi, a great sage, who lived in the Southern India for 54 years, was not interested in the ordinary events of the world in which other persons become interested. He was not married and therefore, he had no experience of family ties and of the world of children. In Sat–Darshan Bhashya, (one of his good books) he writes (verses 15 & 16) as follows:—

Past was present when that was current
When it comes to pass, the future also will be present.
Unaware of the present in three-fold time,
Ridiculous it is to discourse on future & past.
Canst thou the number count without the unit one?
Where is space without me and where is time?
The body exists in space and time, but no body am I;
Nowhere I am, in no time I am.
Yet I am everywhere and in all time.

In other words, mind has a close relation to time as datum of experience. In no sense of the term is time an objective reality. We shall now consider in the next chapter how the time-space Maya has been considered in the various religions and then we shall take up the same subject again from the point of view of the new researches made in Science in this connection during the twentieth century.

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CHAPTER 4.

Time space measure in different religions.

The three eastern religions viz. Hinduism, Jainism and Buddism have got good philosophy in their religious literature. Therefore, they are able to give some account of the Time-Space Maya. They believe in the relativity of time and lead us beyond history and geography. Buddh religion says that there are only relations without anything related. The soul is only a bundle of impressions and the Absolute is devoid of all permanent relations. There are three great religions in the west viz. Mahomedanism, Christianity and Judaism. They have got commandments but no adequate philosophy. Therefore, they do not give a satisfactory answer with regard to the time-space Maya. They bury the dead and cannot give us an adequate account as to what is the true end of the soul. The study of the oriental religions in the west has done much to quicken in the western world a sense of the unitary nature of men. But their chief attention is directed towards physical mastery. This attitude has arrested their advance in psychological and philosophical understanding. But the recent researches made in the theory of relativity and in the quantum theory may lead them beyond history and geography. Physical space is now recognized as dependent upon the limitation of our sense perception. Recent physical researches have also shown that when freed from the physical sense perception, consciousness expands to such a degree that it has been termed cosmic.

The eastern religions state that what we are after death is a wrong question, we must find out what we are before death. As the present world is a form of consciousness, the next world will also be a form of consciousness. It will not be a place. The western religions on the other hand keep their goal in a future. Christians say that the actions of the dead will be judged on the doomsday. Muslims also say that their actions will be judged on the Kyamat–day. Hindus have got two versions about this matter. For man of ordinary consciousness, their actions will be judged soon after death and also at the end of Brahma's day, but for those who have realised their self, they obtain a state now according to their realisation.

So long as the river of time was supposed to flow equally through all points of space, events could be divided sharply into past, present and future. All the events of the world could then be represented into a state constructed of three directions of objective space and one of objective time. A surface drawn through the three directions of space at any instant of time had the whole of the past on one side of it, and whole of the future on the other. In itself it contained the whole of the present. The theory of relativity has shown us that such a division is merely the private choice of a particular individual. He can redivide the continuum into past, present and future, much as the search light operator can redivide space into darkness, light and darkness. If he sleeps for 8 hours, the rotation of the earth will have changed his speed through space by several hundreds of miles an hour and will have rearranged his division of the continuum accordingly. If this sharp line of past, present and future disappears, the concept of evolution in time loses all meaning. The universe does not evolve like a pattern in a loom. The pattern is not being continuously woven piece after piece in a time which no longer exists but is spread before us complete in a continuum in which future events have just the same kind of existence as past events. According to the theory of relativity the whole of physical nature follows as like a rainbow or like our own shadow. Philosophical thought especially in the eastern religions has turned to the idea that temporal changes and the flux of events belong to the world of appearances only and do not form part of reality. Those persons who consider the evidence of the senses as truth do not make any progress. We take experience of the waking state and then pass into the dream state where entirely new kinds of time-space measures come within the field of experience and in a moment when we wake up, all these change in a wonderful way. The Hindu religion gave us the relativity of time chiefly on the basis of the experiences of the three states viz. waking, dream and sleep, but Einstein deserves the credit of showing us the relativity of time based on the experiences of only the waking state.

Time is an important element in life. It separates two lovers by death, it separates friends, father and son, wife and husband. It removes the best leaders of a country in a moment.

Let us now see how the question of time has been considered in some of the Indian scriptures. In Shree Bhagvat, it has been stated at some places that time has come out of God, at other places it is stated that time does not exist in God, because God is eternally complete. At one place in the Bhagwat it is stated (in the Gopi Git) (त्रुटिर्युगायते त्वाम् अपश्यताम) i.e. (one devotee says) " One moment appears like Yuga (Millinium) when we do not observe You i.e. God."

YOGA VASISTHA

In the Yogavasista, Shri Ram asks Vashista about the nature of time and space and Vashista replies as under:—

"Time and space, O Rama, are thoughts; it is upon thought that their existance depends (3–110–59). Just as the appearance of the world is a thought appearance so also is the experience of moments and ages. (3–20–29). A moment is, without any doubt, experienced as a Kalpa (a cyclic period) when consciousness of a Kalpa is experienced in it; similarly a Kapla period is experienced as a moment if the consciousness of a moment is present in it (3–60–21). The same period of a night is experienced as a Kalpa by the miserable and as a moment by a happy person. In dream, a moment is experienced as Kalpa and a Kalpa is passed as moment (3–60–22). Time–space order is dependent upon mind. Mind can experience a moment as a Kalpa and vice versa within itself. (3–103–14). What is a life-time to man is an hour to Brahma; what is a life–time to Brahma is a day to Vishnu, what is a life-time to Vishnu is only a day to Siva. He whose mind is lost in meditation experiences neither day nor night (3.60;25–26). A day passes as a year for those who are separated from their beloved (3–20–51). The whole world-process occurs within a millionth portion of a moment of consiciousness of the self (3–61–17). The extent of the same world process may be a moment for some and a long age for another being. As a person experiencing a dream has the experience of stability, so a person experiencing the waking condition has the experience of the world-process (69–61–29).

Such being the nature of time and space, those students who are learning histories and geographies in the high schools and colleges, are learning falsehoods. When the relativity of time and space will be taught to the students the study of history and geography will not be necessary.

Relativity of time depending upon the state or condition of the mind is not different from the relative condition of coordinates In both cases observer and his instrmment of measurement are the chief factors.

In this chapter, some examples are given from the Indian mythology to show the wonders of time and space. The incidents that are given below may or may not have occurred but the new Science of Relativity helps us to understand that such events can occur.

Sudama's Experience of Time-space Maya.

Once Sudama, the great devotee of Lord Krishna prayed to the Lord to show him His Maya. Shri Krishna promised that it will be shown to him on some suitable occassion. After some time, Shri Krishna became the guest of Sudama and both of them went to take a bath in the river. There, Shri Krishna told him (Sudama) that they might have the play of diving into the river, with a view to know who is able to remain in the water for a longer time Accordingly, both of them plunged into the river. Then Maya came, she took hold of Sudama's legs and threw him in a distant jungle. Sudama saw a deep forest before him. There he sat for some time for taking rest. In a short time, some robbers came there. Sudama became frightened and climbed on a tree to save his life but the robbers found him out. They brought Sudama down and took him to their village. The robbers were devotees of a Goddess whom they wanted to offer the sacrifice of a man, by killing Sudama. But the daughter of the head-man of robbers fell in love with Sudama.

Before Sudma was taken to the temple of the Goddess for sacrifice, that daughter disguised herself as the Goddess, entered the temple and when the time for sacrifice came, she proclaimed loudly that the new guest should not be killed but should be married to the daughter of the Head man. Accordingly, Sudama was married to the said girl. He had four children by this wife. All these incidents had happened during the moment's plunge in the river. But Sudama knew nothing about the truth of his new life and of his new wife and children. After some years, Sudama asked his wife, how far was his native town Sudamapuri from that place. His wife went to ask her grand mother about it. Her grand mother said, "If a ship is sent there, it would take 3 years to reach Sudamapuri". Sndama began to wonder how he has come to such a distant country.

In fact, if he knew how to come out of the river, he was already in his native town. But he was ignorant of the illusion of his time and space. He considered himself as belonging to a different country and living in different time. After some time, he saw a dead body of a woman being carried by some persons and this was followed by the husband of that woman.

Sudama asked his wife what was the nature of that event. His wife said that in their country, it was the custom that when a wife is dead, the husband is forced to burn himself with the dead body of the wife. After this incident Sudama asked his wife not to do any hard work of the house because if she died first, he would have to be burnt alive. But Maya had her own way and one day, the wife of Sudama was bitten by a serpant and she died. According to the custom, sudama was taken to the funeral of his wife and was asked by his relatives there to prepare himself for being burnt. Sudama asked their permission for a few minutes for plunge in the river aud for praying to the Lord. This was allowed. Accordingly he had a plunge and then Lord Krishna asked Maya to bring him back. When Sudama came out of the plunge, he saw Shri Krishna before him as if nothing had happened except their moment's plunge in the river. Shri Krishna asked Sudama whether he saw anything in the river. Sudama was surprised to find that he had experienced events of about 30 years in a different country during a moment's plunge in the river.

If we apply this incident to our every day life, every human being is formed of a drop of water that has come out from the body of his father and everyone has made a plunge into that water and everyone is experiencing 50 or 60 years events in that plunge, but if he can come out of the plunge and if he can give up his bodily consciousness, he is one with the eternal spirit. This is the wonderful effect of the time-space Maya. This incident of Sudama's Maya may or may not have happened but in dream a man gets many such experiences and in the waking life, it is possible to get such experiences if one knows how to change his system of reference.

2. Time Space Maya seen by another devotee Akrur.

When the devoteeAkrur was carring Shri Krishna and His elder brother Balaram in his chariot from Gokul to Mathura, he came to the banks of the river Jamuna. There Akrur stopped the Chariot and himself plunged into the river for bath. At that time, he saw both Krishna and Balram in the river. He was surprised. He came out of the river and again he saw these two brothers sitting as before in the chariot. In order to be certain, he again plunged into the river. There he saw God Narayan with four arms and with serveral powers serving the Lord.

Then he offered his prayers to the Lord stating that all these incidents of life are seen as different events through ignorance because you are one without s second. All the living beings have come under the influence cf your Maya. Only when a man has conquered his ignorance, he is able to understand your time-space Maya.

The wonderful discovery of the new science of Relativity now convinces us that space means nothing apart from our perception of objects and time means nothing apart from our experience of events.

3. Time Space Maya Seen by Arjun.

This incident is given in the eleventh chapter of the Gita. In the tenth chapter, Shri Krishna has explained to his devotee Arjun about his vorious powers of Vibhuties, and that all these were part of his spiritual essence. There-upon Arjun prayed to the Lord to show him his cosmic form i. e. Vishva Rup. Shri Krishna said that it was not possible for him to see this cosmic form with the ordinery eyes. Therefore Arjun was given spiritual eyes and then Arjun saw many worlds simultaneously in that cosmic body of the Lord, who had many eyes, ears and mouths. A light equal to thousand of suns and moons was also experienced. Arjun said that in that cosmic form, there were no directions like north or south, up or down.

Modern Scientifice thought also tells us that space and time are not objective realities to which everything must confirm but are concepts, which in this region of phenomena must be transcended. They are not the objective realities independent of consciousness. If Arjun was not endowed with a divine consciousness by Lord Shri Krishna, he would not have been able to experience the cosmic form. It is also said in the 15th Chapter of the Gita (stanza 3) that this world has neither beginning or an end nor does it exist in the middle.

Physical space is now recognised as something definitely dependent upon the limitations of our sense-perceptions. Each series of events has its own time order and it is difficult to relate the one to the other since there is no common standard time. Different creatures differ enormously in the amount of duration which they intuitively feel.

The question as to what shall succeed our attainment of selfhood cannot logically arise, for, succession and happening are possible only within time and change and are meaningless when these are transcended. Einstin's discovery of the law of relativity has demolished old land marks, and territorial divisions between philosophy and physical science have lost their definiteness. The new science compels us to admit that what we see are events. There is no spatial relation between one man's percepts and another's i.e. no two persons see exactly the same object. Each carries about a private space of his own which has no space in common with another. Physical space and time are a matter of inference and constructio..

3. Illusion of time experienced by the devotee Narad.

Once Narad asked Shri Krishna to show him his Maya. Shri Krishna promised to show it on some suitable occasion. Once upon a time Shri Krishna and Narad went for a trip in a forest They went very far. There Shri Krishna became very thirsty. Therfore, he asked Narad to bring some water for him. Accordingly Narad went in a neighbouring village to fetch water for the Lord. He saw a house and knocked the door. Immediately one beautiful young girl appeared at the door. On seeing her face, Narad forgot the mission of water and began to talk on various other matters with the young girl. Their talks lasted for hours i. e. upto the evening yet their topics were not finished. Narad promised to come to her next day for further talks. He forgot all about water and remained in that village thinking about the talks of the day. Next day Narad went to the same young girl and that day was passed in similar talks. In this way, some days passed, during which time, a kind of love was created between them. Ultimately, they married and Narad got good wealth from his father-in-law in marriage. Narad passed some years in married life and had three children. Once upon a time, there was considerable flood in the river of that village and people began to run to different places to save their lives. Narad also came out with his wife and children. But before he could make his way, the flood increased and Narad lost hold of one child. That child fell into the river. While trying to save the child, Narad lost hold of his other two children who were also carried away by the flood. Subsequently, his wife also was carried away by the flood and Narad was left alone weeping for the loss of his family. At that time, some voice came from behind Narad, asking him to fetch a cup of water, that it was already half an hour since he was sent and he had not yet returned. Narad recollected the message of the Lord for water and began to think how 12 years period had elapsed in that half hour. Immediately he came back to the

Lord and begged his pardon. This is one kind of illusion of time as experienced in a married life. Many married persons experience rapid passage of time on the first night of their marriage, and a slow passage of time, when in latter years, the wife gets the upper hand and gives repeated scoldings to the husband.

4. Time in the life of Shri Raman Maharshi.

For those who are continuously enjoying the spiritual bliss, time passes very quickly. Shri Raman Maharshi had been at one place for 54 years. In these 54 years, our world had seen many important changes in two great wars, yet these events had left the Maharshi absolutely untouched. He had remained practically unconscious of these events. He had often been heard to say that these years had passed in a flash. Time depends on the events. Where there are no events, there is no time as in sound sleep and in the state of meditation.

5. Story of Revti's betrothal

There is a story in Indian mythology of a king Revat who went to Brahma ब्रह्मा to ask him to which king, his daughter. Revti should be betrothed. At that time, good singing and dance were going on in the

Court of Brahma. Therefore, king Revat sat there for a while. Within half an hour, the performance was over. Then king Revat consulted Brahma regarding the betrothal of his daughter. Brahma replied that within the period of half an hour, during which he (the king) was sitting there, several cycles of time युग had paseed in his country and all the princes he had in view for betrothal had died that a new cycle of time i. e. Yuga had commenced in which Balaram had been born and that his daughter may be bethrothed to Balaram.

There is nothing absolute about space or time. Different observers make different estimates of space and of time. Each series of events has its own time order and it is difficult to relate the one to the other, since there is no common standard time.

There is no difference between the experiences of waking and dreaming. Still the one is considered to be stable while the other is not. Modern philosophers who base their convictions on the theory of Relativity, say that our waking state is also not stable. Russell says, "All adaptation to environment acquired during the life of an individual might be regarded as learning to dream, dreams that succeed rather than dreams that fail. The dreams, we have when we are asleep usually end in a surprise, the dreams we have in waking life are less apt to do so... one might say that a person properly adapted to his environment is one whose dreams never end in the sort of surprise that would wake him up. In that case, he will think that his dreams are objective reality. But if modern physics is to be believed, the dreams we call waking perceptions have only a little more resemblance to objective reality than the fantastic dreams of sleep. They have some truth but only just so much as is required to make them useful."

At the time of dreaming, even the dream is regarded as the waking state because at that time it is felt as stable: and the waking experience will be taken as a dream if one realises its instability. In the waking experience, the objective world is an expression of consciousness in the same way as the sensible qualities, sensations, and thoughts of a dream are the expression of consciousness. It is stated in the Yoga Vasistha that the entire world including the egos etc is a long dream (3-42-8). The ways of mind are wonderful.

But there is a fourth state (other than the three viz. the waking, the dream and the sleep states) of existence in which there is no discrimination of the ego and the non-ego, of being and non-being. It is a state of pure and balanced indifference. This fourth state is experienced when the ego is transcended, equilibrium attained and mind is brought to rest. The true subject is simple, self-subsistent universal spirit which cannot be directly presented as an object. It is a type of experience which is not clearly differentiated into a subject-object relation, it is an integral undivided consciousness. It is a condition of consciousness in which the feelings are fused, ideas melt into one another, boundaries broken and distinctions are transcended. Past and present fade away into a sense of timeless being and the distinction of knower and known disappears.

As long as the soul is governed by material desires, it must find its home in physical realms. When its inclination is purely spiritual, it will inhabit the domain of spirit.

Before attaining the last stage, the aspirant should cultivate some kind of detachment from the habitual nature. A doctor, for instance, examines his patients with detachment but when somebody is sick in his own house, he cannot maintain that detachment and he has to seek the help of another doctor. Similarly a pleader conducts many cases with detachment but if there is a court case in his own family, he has to seek the advice of another pleader. A municipal clerk records the births and deaths of a town with detachment but if someone is born in his family or if some one is dead in his family, he does not maintain a balanced mind.

The principle of equivalence that is taught in the theory of Relativity, if applied to our practical affairs, will show us that equilibrium must be obtained in all situations in life. In playing on a piano or harmonium or other musical instrument, the instrument has to be adjusted according to the tune. Our mind should also be adjusted and brought to equilibrium in all circumstances.

6. Relativity in the Ramayana

When Shri Ram went to Janakpur on the occasion of the marriage of Sita and when he entered the pandal where several kings had gathered and where the bow had to be broken, he (i. e. Ram) appeared different to different persons. To the kings he appreared like a great king; to the sages he appreared as a great sage and to Sita, he appeared as a great lover. In fact, every one saw him according to his own nature.

7. Relativity in Shri Bhagwat.

Relativity of vision is described in Shri Bhagwat in the following three places:—

(a) When Shri Krishna went to kill Kansa who had made preparations to kill Shri krishna, Shri krishna appeared in 9 different forms as follows to nine different kinds of observers:-

1. to the wrestlers, he appeared as a big wrestler.
2. to human beings as a great man.
3. to females, he apprered as a great lover.
4. to his kinsmen, as a good relative.
5. to kings as a great ruler.
6. to his parents as an obedient child.
7. to Kansa, as the God of Death.
8. to ignorant men, as a cosmic being.
9. to Yogis as the supreme spirit.

(b) Once when Shri Krishna was playing with the cowherds, he appeared.

1. to the sages as a great sage.
2. to the devotees as a personal God and
3. to ordinary persons as an ordinary person.

This incident is given in stanza 10-12-11.

(c) It is stated in stanza 2-1-36 that everyone sees God according to his own conception.

8. Time in the Upnishads:

The question of time has not been specifically treated in the Upnishads. But in the commentary of Shri Shankeracharya, some good hints about this important matter are found. For instance, at one place in the Mundak Upnishad he states **काल स्तु कर्माङ्गम्** i. e. time is part of karma or part of an event. This definition agrees with the modern science.

At another place i. e. writing a commentary on Karika 14 of the 2nd Chapter of the Mandukya Upanishad, he gives a good example of the relativity of time. One man goes to a milkman to bring milk. The milkman had not milked his cow. He therefore told the customer to wait till he can finish the milking work. The customer said that he would wait till he can finish the work. In these double events, there is no uniform time. The time of milking depends on the time of waiting of the customer and the time of waiting depends on the time of milking. These two events cannot be measured by any uniform watch but each event will create its own time. Shri Shankeracharya proves in this commentary that both the times created by the events are imaginary.

In order to understand the relativity of time, one should cultivate the habit of being, to some extent, a spectator of events. In our ordinary limited experience of joys and sufferings in life, our self goes so much in our acts that a disinterested out-look becomes impossible. We screen truth by hopes and fears, by our desires and disappointments. We are caught up in the meshes of attraction and repulsion and consequently we do not live an experience completely. This can be properly understood if we can separate the factor of observation from the observer. Our identification with every successive moment of experience does not permit us to make the experiment of isolating the spectator from the spectacle. Therefore it is necessary for a man of genius to cultivate a habit of remaining in solitude for some time. This habit will result in detachment from the body and bodily viewpoint. It is stated in Drig. drashya Viveka (Verse 30) that " With the disappearance of attachment to the body and with the realisation of the supreme self, to whatever object the mind is directed, one experiences Samadhi." In this state the observer enters as it were in a new state. The root cause of all sin and suffering is egoism, and egoism means attachment of the observer (Soul) to the limitations of body, life and mind. Such limitation brings fear, insecurity, and a general feeling of meaninglessness in life. The psychic Universe is unique to each ego. That can be easily understood, but that the physical universe itself i. e. our conception of it is entirely mental is now becoming farely well accepted by most of our distinguished scientists. This subject of physical relativity will be explained further in the next two chapters.

9. Time in the Patanjala Yog-Sutra.

It is stated in the above Sutra, that by concentrating on the smallest part of time, i.e. Kshana and its succession one can get the power of discriminating the truth. The smallest part of time is not divisible, and it will not continue at the next moment. A bundle of parts of time is not conceivable, and one part does not go beyond its own limit. Therefore, time does not last beyond the event. At another event, there is another time. The limit of the event under consideration can be recognised but the continuation of that time beyond that event is false, it is an illusion. Two times cannot exist in one event. Therefore, only present time comes within the range of experience.

When two friends are to go by two different trains, one says that his time has come; the other says, his time has not yet come; therefore time is something personal and relative. Time being relative it is not possible to find valid reasons for the creation of the world. Sir Radhakrishna writes as follows in the Hindu view of life page 67 'The hypothesis of creation is a weak one. It assumes that God lived alone for some time and then suddenly it occurred to him to have company when he put forth the world. The theory of manifestation is not more satisfying for, it is difficult to know how the finite can manifest the infinite. If we say that God is transformed into the world, the question arises whether, it is the whole of God that is transformed or only a part. If it is the whole then there is no God beyond the universe and we lapse into lower pantheism. If it is only a part, then it means that God is capable of being partitioned. We cannot keep one part of God above and another part below. The history of philosophy in India as well as in Europe has been one long illustration of the inability of the human mind to solve the mystery of the relation of God to the world ".

In this connection Bradley says that it is impossible to know the Absolute from the relative point of view. For knowing the Absolute, the relative must become the Absolute and in becoming the Absolute, the relative ceases to be relative.

True religion concerns itself with the givenness of the timeless. An idolatrous religion is one which substitutes time for eternity, either past time, in the form of a rigid tradition or else future time in the form of pogress towards Utopia. And both are Melochs, both demand human sacrifice. It is only by paying our attention and our primary allegiance to eternity that we can prevent time from turning our lives into a pointless and diabolic foolery.

If the mind which is not anywhere becomes conscious of visual scene constructed so as to present the surroundings as from a particular point in space, it will have the illusion of itself being at that point of space. Similarly with time. Our clock is at ourselves and records only the epochs of events at ourselves..

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CHAPTER 5.

Four–dimensional Continuum.

A three dimensional world contains objects and objects have length, breadth and depth. A four–dimensional world contains events. There time is taken as a dimension in the same way as length and breadth. This gives us a new picture of the world. In a four–dimensional Continuum we get the following dimensions:—

1. Front and back.
2. Above and below.
3. Right and left.
4. Earlier and later.

As we can change the front and back or above and below of an object, it is possible to change sooner and later of an event. Supposing some one wants to go from Ahmedabad to Bombay. What is the distance between these two points and when will the passenger reach Bombay? That depends on the vehicle or the measure used. He can reach Bombay by train in 11 hours or if he wants to reach Bombay earlier, he can go there by plane in two hours. The time of the journey can be changed by the passenger by using another measure. In the physics of Newton, time was something objective so that an event could not exist without time. After the discovery of the theory of relativity, time has become relative, so that time cannot exist without events or in other words every event creates its own time.

Dream time

Suppose, Some one from Ahmedabad goes to Calcutta in his dream. There he finds that some riots have taken place and wants to return to Ahmedabad. Ordinarily, it would take him 2½ days by train but if he wakes up, he comes back in a second. In fact, there was neither going to Calcutta nor actually coming back. Here, time was created by the dream sensation and it was changed by the waking sensation. It was a subjective time or a psychological time. The transition from the organic to the psychic sphere is a transition from one periodicity to another.

Four-Dimensional Figure

A three-dimensional figure is often shown on a two-dimensional black-board by artistic methods, similarly in the Indian culture, the nearest approach to a four-dimensional figure is the 'Kundali' of the Astrologers.

The figures within indicate how the life of the man will progress. If the time of the birth is changed by 5 or 10 minutes, the figures within the drawing will also change. This time-space continuum is held to be correct so long as a man remains in a man-sized time and a man-sized space. If he gets some spiritual experience and thereafter begins to feel that he is the soul and not the body, then he enters into a different periodic system. In the new condition human time and space will not be applicable to him. Einstein has proved that the laws of phenomena in the system of a body for an observer who is connected with it, will be the same whether that system is at rest or is moving uniformly and rectilinearly.

Time on different Planets:

The time. on our earth is measured by its movement round the sun. Every time the earth turns on its axis, we mark down a day. With this as a basis, we say that it takes a little over 365 days for the earth to complete its revolution round the sun and our 365 days, we call a year. But now consider some of the other planets. With our time as a basis it takes Jupiter 10 hours to turn on its axis, as compared with the 24 hours taken by the earth.

Saturn's day is less than one-half our day and our day is more than twice Saturn's, that is, according to the calculations of the inhabitants of the earth. Mercury completes her circuit around the sun in 88 days; Neptune in 164 years. Mercury's year is but one-fourth ours, Neptune's year is 164 times ours. Observers at Mercury and Neptune would regard us from their standard of time which differs from our standard.

Age of a human being.

Generally, the age of a human being is measured by human time and so long as a man remains a human being, he is subjected to a human time-space continuum. In the dream condition, however, the waking time becomes useless and new time is then created according to the dream condition. In the waking state also time changes according to the emotion. For instace,in love affairs, time passes very quickly and in painful condition it passes very slowly. This is the condition of psychological time. In a dream a man sees his father. He takes his father as older than him, whereas the fact is that the dream father and the dream son have appeared at the same time. In waking condition also, a father is called a father only when a son is born to him, so that father and son is a relation and relations are neither before nor after, for instance, uncle and nephew also come in existence at the same time. Until a nephew is born, an uncle does not exist. Relatives are relatives. Their relations depend on relations and relations have relative time and space. That is proved by the Theory of Relativity. Modern physical science places before us a four-dimensional continuum. We shall now give some examples to show how different kinds of continuums come in existence.

Example 1.

A Cricket Field.

A cricket field is a four-dimensional continuum. In that field the appearance of the different players changes. Some players sometimes show a fast play and sometimes they show a slow play. In that play backward and forward changes very often and sooner and later also changes very often. No body can say beforehand, which player will make how many runs and when there will be an over. If we take the photo of the play, we shall get a different photo on all occasions. Therefore, what we see are events and not objects. A similar condition is experienced in a race-course. A stone also lives in a four-dimensional continuum. As the earth moves round the sun at the rate of 18 miles per second all the stones and trees also are moving at that rate if we can see them from the sun.

Example 2.

Tennis play on a Steam-boat

On some large steamers, suitable accomodation is made for tennis play. When the play is going on, it becomes a four-dimensional continuum. All the events in the play happen as if it is being played on the land. These events are not affected by the motion of the steamer, because the balls, rackets and players are all affected equally by the motion of the steamer. Although the steamer is moving, it can be treated by the men on the steamer as if it is not moving and can be treated as an inertial system of reference. Similarly, although our earth is moving round the sun at the rate of 18 miles a second, we do not feel that motion and the whole system including the observers on the earth can be treated as an intertial system of reference. If there is a louse in a man's head and the man may be moving on the road, the louse does not feel the motion of the man and takes his head as an inertial system.

Example 3

Falling of the apple on the ground.

Newton said that an apple from a tree falls on the ground because there is a force of gravitation. The new science of relativity has proved that the apple may go down or may go up. Supposing a man is going up in a lift in a high building. He has an apple in his hand and while ascending, the apple falls from his hand. It will fall on the floor of the lift :but from another point of view, during the time that the apple falls, the lift is moving up as it were to meet the apple. Both viewpoints will give equal results. By introducing the principle of equivalence,. Einstein replaced the idea of 'a force of gravity' by the concept of a geometrical space. And since a space is characterised by its co-ordinates, the knowledge of the co-ordinates of a space is essential to a study of how things move in a space. In other words, the distance between two points, or rather, the square of this distance viz., ds takes on various forms , It depends upon (a) the surface in question and (b) the co-ordinates used.

The theory of relativity is concerned with finding out those things which remain invariant under the transformation of coordinate systems.

Example 4

If a man has to alight from a moving bus or from a moving train, he must readjust his time and space otherwise he will fall.. He must keep his face towards the motion of the carriage and measure his speed of alighting with the speed of the vehicle. In the same way, when one wants to rise to a spiritual plane , he must readjust his time and space. If he sticks to his former relations or former coordinates, he may lose the balance of mind. Therefore those who want to progress cannot remain in the company of those who want to stick to their old habits. When a man sleeps in a train, he has no consciousness of guards and passengers changing at different stations. In fact there are no events in sound sleep and therefore there is no time. Time is felt only when there are events.

Example 5

Two events in different places considered as simultaneous from one system of reference will be separated by a definite time interval from the point of view of another system. Also two events happening at different times at the same point of one system of reference will be separated by a definite space-interval from the point of view of another system. For instance, supposing a man is travelling in a mail train, from Bombay to Calcutta. He takes his morning breakfast in the dining car at Kalyan and his afternoon tiffin in the dining car at Bhusaval. Although the two events have happened in the train, there is a space-interval of about 200 miles, as considered from the point of view of the station masters.

Example 6

For those persons who died before 15th August 1947, Pakistan was not a separate country. In future also, all nations might become one. In Kathiawar, several states have been united and now there is no longer a Jamnagar State or a Bhavnagar State. The divisions which were considered to be real have become unreal. Divisions of Pakistan and Hind have now become real. Those who are newly born will accept the new situation as a true one. The late Viceroy of India Lord Linlithgow had, during the second world war, changed Indian Standard time by one hour and then replaced it after three years. Some children who were very young thought that the second alteration was a new time where as the elderly people knew that it was only the old time replaced.

Example 7

Space intervals can be converted into time intervals and time intervals can be converted into space intervals which means that a numerical value of a given distance or a period of time will be different as measured from different moving systems. For instance, in practical life, one man says that the station is at a distance of about 15 minutes walk from his house. Another man sitting there says that he will give his motor car and therefore the station may be considered as only 3 minutes distant. This is an example of reduction of space by means of another time measure. Now let us consider the time question. One contractor says, he can finish a building in one month. Another contractor who is more energetic says that he can finish it in 20 days. Here there is a reduction of time. by means of the ability of the worker.

Example 8.

In the music of Jaltarang, very often the player has to adjust his instrument for different songs, by reducing or increasing the water kept in different cups. This is called the adjustment of measures. The most difficult thing in our life is to find the right measure for every event. When we begin to understand all events by means of only one measure i. e. according to our limited consciousness, we encounter several difficulties. This is also the cause for wars and riots. Generally, a man tries to understand the world by what is called the mob-consciousness. It is only in cases of error or misery that he begins to consider the act of knowing or the act of perception rather than the object perceived.

Example 9.

If a bird is kept in a passenger train and if it flies out of the train, it will be able to come back in the train only if it flies upto a certain distance. If it flies to a greater distance, it will not be able to come back. For that event, the time and space change according to the system. All events are happening in a four-dimensional continuum. The splitting of this four-dimensional continuum into three dimensional space and one dimensional time is purely arbitrary and depends upon the system from which the observations are made.

As element of creation enters into ordinary everyday perception. The view that external objects exist in space exactly as we see them is extremely difficult to maintain. We must provide a good deal of the environment which we commonly think of as simply there. Pure fact is an event in a continuum of ineffable aesthetic qualities, not an external material object. It is the problem that designates the method, not the method which designates the problem.

If time is to be defined in terms of events, it must be impossible for the universe to be unchanging for more than an instant. This means that there is no change but all are appearances.

Example 10.

When you are going away on a long and continuous journey if you write home at regular intervals, you should not be surprised that with the best possible mail service, your letters will reach home at progressively longer intervals, since each letter will have a greater distance to travel than its predecessor. If you were armed with instruments to hear the home clock ticking, you will find that as your distance from home keeps on increasing, the intervals between the successive ticks (i. e. its seconds) grow longer so that if you travelled with the velocity of sound, the home clock would seem to slow down to a stand-still. You will never hear the next tick.

Precisely the same is true if you substitute light rays for sound waves. If with the naked eye or with a telescope, you watch a clock moving away from you, you will find that its minutes hand takes a longer time to cover its five minutes intervals than does the chronometer in your hand, and if the clock travelled with the velocity of light, you will for ever see the minute hand at precisely the same point. That which is true of a clock is, of course, also true of all time intervals which it measures so that if you moved away from the earth with the velocity of light, everything on it would appear as still as on a painted canvas. This means, in other words, that your time has apparently come to a stand-still in one position and is moving in another. All this seems absurd enough but it does show that time alone has little meaning.

Example 11.

In a motion picture, each photograph by itself conveys a sensation of space i. e. of three dimensions; but one photograph rapidly following another conveys a sensation of (space and time) four dimensions. In this case, space and time are interlinked.

Example 12.

Objects in space moving with different velocities build up different time intervals. Thus the velocity of the star Arcturns, if compared to the earth, moves at the rate of 200 miles a second. Its motion through space is different from ours.

Example 13.

If, I go for dinner to a friend who is a pleader, at 12 o'clock, the pleader tells me that

I have come very late because the pleader has the habit of taking his meals earlier and if I go to a doctor at 12 o'clock, the doctor says that I have come very early because the doctor has the habit of taking his meals in the after-noon. Experience of earlier or later depends on habit and is subjective. A man fits every experience into the pattern of his existing ideas. It seldom occurs to him that his pattern may be faulty or relative. Ordinary human perception is confined to mere appearances. It never gets at what is ultimate in this world and is condemned to view the God of Reality under graven images. We know only what the senses tell us. Our experiences, are purely relative to them.

Example 14.

If I have to go to another place in a motor car, the speed of the car determines the time the journey will take. It is a four-dimensional continuum. If some defect occurs in the machinery of the car on the way, the speed is changed. If some one sleeps in the car, he does not feel the time of the journey in the same way as other occupants. Nothing remains the same for two consecutive moments. No man can twice enter the same river. This was said to Uddhav by Shri Krishna when explaining the nature of the world.

This idea was also uttered by the Greek philosopher Heraclitus. Recent science also describes nature as consisting not of things but rather of events, a continuous series of happenings i. e. a relative process.

Example 15.

All musical songs and all dramas are four dimensional continuums. Their time is not fixed beforehand. In these events time is created with the events. If some one does not like the music or the drama, he will feel that the time is too long; if some one likes it, he will prefer that it should continue. Our world is also a great drama. First sight is not necesarily true sight. The senses can tell us something about things as they appear to be but little about things as they really are. If we see a thing at perfect rest like our earth and science tells us that it is really in a state of perpetual motion, then we are entitled to conclude that the anomaly is caused by the limitation of our own perceptions which in the end is our own consciousness. The stability which we see cannot be anything else than a mentally constructed one.

Example 16.

On one occasion when a pennant (flag) was blown by the wind, two Buddhist Bhikshuks entered into a dispute as to what it was that was in motion. They came to the conclusion that nothing moved. What was actually moved was their own mind. This is called mentalism. The world-stuff is of the same tissue as that of which our own ideas are made. We lapse into thoughtlessness and the world disappears. We think and the world appears. This means that the mind and the world are inextricably interwined. When we speak about our experience of the world it is really the world of what our senses tell us. This means that we are only giving an opinion, we are not giving a piece of correct knowledge. Whatever is thought, felt or observed is somehow related to a mind which thinks, feels or observes. The knowing self and the known not-self may seem apart in space but they are not apart in the awareness itself. In the language of science, we can say that the observer enters into every observation.

Example 17.

In the Indian scriptures, Lord Narayan is supposed to have four hands, Brahma has four mouths, ॐ (Oum) the sacred syllable has four aspects, and the latest science says that the world is a four-dimensional continuum. This means that the observer is always there in every act of perception, as in every act of description.

If we take away the observer from the world, we are forced to take away the world itself. If the world is externalized, it is externalised in and by the mind. It is the spatialising activity of the mind which generates multiplicity and it is the temporising activity of the mind which creates sense of time. The sense of order accompanies us in dream as well as in waking. The absence of order is not noticed so long as the same state continues, though on waking we find that the happenings in the dreams were grotesquely incongruous. The states give rise to the worlds but no world can give rise to the states. Neither dream-memory nor dream-intellect discloses the unreal nature of the experience. There is no suspicion aroused in us that we are befooled all the time. In the dream, we have a body, the senses are active, objects appear and the mind unquestionably takes it all in real earnest, and the delusion lasts till waking rules out the whole picture of the dream-time-space as a mere sport of fancy. The dream-ego is attached to the dream-body and is moved by the dream interests. In struggling with the dream-tiger, the dream-ego does his utmost to save his dream-life. When he wakes, he finds himself transformed into the waking ego with relations to another world and with other interests. He recollects his dream and has a hearty laugh at its illusive shows. The western philosophers who have studied the Theory of Relativity now declare that our waking life is also like a great dream and that what we measure by a particular measure will apprear to be invariant so long as the measure will be found to be invariant.

Example 18.

One of the wonderful results of the discovery of the Theory of Relativity is seen in the fact that the path of light becomes curved in the field of gravitation and the stars that we see in the sky are not where we see them. Their light-rays are curved when they pass near the sun.

This fact was proved by taking photographs of the stars at the time of the eclipse of the sun in the year 1919. The radiation projected by a broad-casting station is also curved where there is electro-magnetic field created by aerials on the top of the houses of those who possess radio-receiving machines. Similarly the light of the soul is also curved when we are in the company of those whom we like or dislike. A structure in an electro-magnetic field does not possess the same quantum specification as a structure in field-free condition.

If this discovery be applied to psychology, the beginner on the path of devotion will have to remember that a natural gravitation field cannot be transferred where attracting matter exists. Therefore, he must give up attraction and repulsion and surrender to God before he can hope to ascend to a higher field. Einstein's Theory of Relativity has shown that the course of ray of light depends definitely upon the geometry of the space, through which it moves. No space is rigid and no system of reference is rigid. The quantities which enter as multipliers into the expression for the interval element also specify the gravitational forces in any region. A gravitational field of force is exactly equivalent to a field of force introduced by a transformation of the co-ordinates of reference. This means that as soon as a man thinks about his soul or God, he creates or enters into a new reference system. Bodies take the course which is easiest at each moment according to the character of the space-time in the particular region.

Example 19

If a lead ball is kept on a cusion, its very presence creates a curvature in the surrounding space. In the same way, mere existence of matter creates a curvature in the surrounding space. If we see a mountain in a dream, we create a space for the mountain at the same time.

Example 20.

The first world war took place from 1914 to 1917. The light rays of the events of that war may be reaching some stars now, so that if we be on those stars we can see the first world war even now. Light moves at the rate of about 186,000 miles per second and there are certain stars, so distant from the earth, that light takes hundreds of years to reach there. If we can go to a star where light takes about 150 years to reach, we can now see the battle of Napoleon. All these examples show that past and future are only imaginations. Nature knows nothing about them. The theory of Relativity has placed before us a relative time-space-frame for all events. The frank realisation that the physical science is concerned with the world of shadows is one of the most significant advances in modern physics. Nothing that varies for different observers can be fundamentally true.

B. Russell writes at one place as follows:—

"One cosmic time and one persisting space are abolished. We have space-time instead. Our motion of the world-structure is changed. Is London a place? But the earth is rotating? Is earth a place ? It is going round the sun. Is Sun the place ? It is moving relatively to the stars. We can, therefore, only talk of a place at a given time ? But what is a given time ? We think that the Universe is in one state at one time. This is a mistake. There is no cosmic time. We must give up the idea of bodies moving and talk of events. The unity of a body is the unity of its history like the unity of a tune. The idea of a persisting substance must go. So the motion of space evaporates. We cannot speak unambiguously of the distance between two bodies at a given time. If we take the time appropriate to one of them, we will get one estimate. If the time of another, another estimate. If we could intuit ourselves and other things as they really are, we would see ourselves in a world of spiritual natures, our connection with which did not begin at our birth and will not cease with the destruction of the body."

Example 21.

If a man has to walk for 4 miles, after going 3 miles he becomes exhausted. Therefore, the last one mile appears to be longer than usual. The world is measured by our senses and the senses do not keep a uniform pattern. Each experiencing subject has a universe which is absolutely and entirely his own. If we speak of our really different universes as one and the same—when, for instance, we say "I am seeing the same sun as you", that is only because, what is experienced is assumed to be similar. Each one of us really experiences what is primarily built up of his own individual sensations, thoughts and ideas, even though these are induced in the individual in spheres of time and space. Thus it happens that if there is a multiplicity of experiencing entities as individuals, there is also a corresponding multiplicity of relative universes.

Example 22

One man says that his time passed quickly to-day, another man says that to-day he did not know how to pass his time. This shows how time is personal and subjective. In one sense, it must be admitted that we can never prove the existence of things other than ourselves and our experiences. In short, my world consists of myself and my thoughts and feelings and sensations. The sense-data in the dream do not appear to have corresponded with such physical objects as we should naturally infer from our sense-data. B. Russell says that there is no logical impossibility in the supposition that the whole life is a dream, in which we ourselves create all the objects that come before us.

Example 23.

A mother may be travelling with her child in a railway train. At meal time she asks the child to sit at one place and take the meals. Although the child is sitting at one place, the train is moving from the point of view of the station master or of a man standing on the road. The child is not therefore taking her meals at one place. At every morsel, she is at a different place because the wheels of the carriage are moving. If we happen to pass reversing stations at night while travelling, on waking up sometimes we do not know in which direction we are travelling. It takes a long time to correct our error.

When some fishes are swimming in a deep ocean, they do not know what is north or south or up or down.

If some one is drunk, he sees a different world. When the effect of drinking disappears, he comes back to the ordinary world. With regard to time also, it is the compulsory intensity of attention, which creates a barrier between two times, an intensity which makes the present seem more real and the other illusory. Maya or measure may therefore be defined as follows:–

1. It is false.
2. But appears to be true;
3. It serves practical purposes;
4. It is negated in another condition;
5. It is false because it is negated.

An owl sees darkness in full day-light. If it is reborn as a man, it will see full day-light because its measure will change. Similar events happen in a man's dream. They are negated in the waking condition. Waking condition destroys the dream completely and it is possible to know that spiritual condition will destroy the experiences of the waking condition, because a man in the waking condition lives in a man-sized world with a man-sized time. The dreams which we call waking perceptions have only a very little more resemblance to the objective reality than the fantastic dreams of sleep.

Though we see the sun now, the physical object inferred from our seeing existed 8 minutes ago. If in the intervening minutes the sun had gone out, we would still be seeing exactly what we are seeing. We cannot, therefore, identify the physical sun with what we see, nevertheless what we see is our chief reason for believing in the physical sun.

The question is no longer what the universe is, but how we come to know whatever we do know about it. What happens at one place affords no indication of what has happened in another place. The light of the nebulae which reaches us now started before human beings began to exist. The difference between seeing the nebulae and the furniture is only one of degree.

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Chapter 6.

Origin of the theory of Relativity.

The four-dimensional continuum mentioned in the previous chapter is not in ordinary space but in an ideal field of four dimensions, which results from the blending of space and time. This field is not only four-dimensional but also curved. It is this curvature that prevents a field being an ordinary straight line. Newton supposed that all objects could be located in absolute space and that all events, wherever they occurred, could be assigned positions objectively on an everflowing stream of absolute time. These assumptions provided him with an approximation which was good enough for his purpose and fitted in with the scientific knowledge of the seventeenth century. Subsequent investigation has shown that they are inadequate to explain the passage of light and the behaviour of objects moving at a speed comparable with that of light.

Something was required for the movement of light from one place to another and hence the concept of ether which entered science some two centuries ago or more. When the known properties of gross matter failed to explain a phenomena, scientists met the difficulty by creating a hypothetical all-pervading ether, to which they attributed exactly the properties necesssary to provide an explanation. There was of course a special temptation to resort to this procedure in problems which appeared to call for "action-at-a distance." Thus when no gross material was present to transmit a mechanical action, such as that exerted by a magnet on a steel bar, or by the earth on a falling apple, the temptation to invoke an all-pervading ether became irresistible and what may be called an ether-habit invaded science. In short, ether was invented for the planets to swim in. The astronomical phenomena indicated that if the ether exists, the earth and all other moving bodies must pass through it without disturbing it. If the ether had affected terrestrial bodies, the disturbance it created would have given an indication of the speed with which it was moving, just as the motion of the twigs of trees or of flags gives an indication of ordinary wind-velocity. Various known facts indicated that the ether did not travel with the earth If then the earth is moving through the ether, there must be an ether-wind, just as a person riding on a bicycle through still air feels an air wind blowing in his face.

Supposing a river is twelve miles long and the speed of its current is 2 miles per hour. If some one wants to swim across the river and back, it would take him the same time both ways i. e. he will feel the strength of the current equally. But supposing he can swim at the rate of 4 miles an hour and if he wants to go against the stream for 12 miles and want to come back, it will take him 6 hours to go up-stream and 2 hours to return. On the onward journey his speed will be reduced to 2 miles an hour, whereas on the return journey, he will get the advantage of the current, so that he will be able to swim at the rate of 6 miles an hour. This example shows that the motion of the current changes the time required for the up-stream and down-stream journeys. Applying this example of the motion of the earth through the ether, an experiment was made to find out the speed of the earth through the ether. It is known that wireless signals consist of waves travelling through the ether. The earth is travelling through the ether from west to east. If the American observatory at Aunapolis sent light rays through ether and Greenich observatory with the earth is advancing through the ether to meet that signal, it would meet it sooner than if the earth were standing at rest in the ether. But to know how much sooner and so to discover the exact time of travel of the signal it would be necesssry to know the speed of the earth's motion through the ether.

M. M. Experiment

The famous Michelson–Morley experiment tried to measure this speed in the most direct and most obvious way. If signals travel through the ether at 186000 miles a second and the earth travelled through the ether from west to east at 1000 miles a second signal travelling from west to east would have their rate of travel over the earth's surface increased from 186000 to 187000 miles a second, because the earth would be moving to meet the signal, but that of a return signal from east to west would be decreased from 186000 to 185000 miles a second. A signal which made the double journey would be expedited on the outward journey, but retarded on the return journey. For each thousand miles of path, the outward journey takes 1/187 second, the homeward journey 1/185 second, so that we have as the total, per thousand miles of path:—

Outward time: 1/187 second:–0.005347594.
Return time: 1/85 second 0.005405406
Total time second. 0.010753000

on the other land, if the earth were at rest in the ether, the total time would be:–

2/186 Second–0.010752690 second.

It will thus be seen that the gain of time on the outward journey does not quite make up for the delay on the return journey and there is a net delay of about three millionth part of a second. If this could be measured, we would know that the speed of the earth's motion through the ether was 1000 miles per second.

Michelson & Morley hoped to measure this small difference of time with accuracy. They performed the experiment with light of great purity of colour, the waves of which oscillate many millions of millions of times a second at a perfectly uniform rate and these oscillations provided a very perfect clock. The experiment consisted in starting two beams of light, simultaneously to run the out and home course in the two directions and observing which got back to the starting point first and by how much it won.

If the difference of times had proved large, it would have shown that the earth was moving rapidly through the ether; if small, that it was moving slowly. The one result that was never contemplated was that the time difference should prove to be nothing at all. For the earth's motion round the Sun alone gave it a speed of about 18 miles per second, Yet it was the unexpected that happened. When the experiments were performed, absolutely no time difference could be detected. They were repeated time after time at different times of the day and of the year (so as to get the apparatus pointing to different positions in space and to get the earth at different parts of its orbit round the Sun), under different conditions of temperature, altitude and so forth but nature has consistently given the answer that she knows of no motion of the earth through the ether.

Towards the end of the nineteenth century, a great number of physicists were engaged in investigating how this could be and Professor Lorentz announced a very remakarble conclusion in 1895. He suggested that an object which moved through the ether with a velocity U'might undergo a contraction in the direction of its motion i. e. the ether wind might compress a body moving into it, just as the pressure of ordinary wind must compress a football kicked into it. He said that the apparatus in the M. M. experiment had contracted in the direction of ether stream.

In 1905, Einstein gave a new and quite revolutionary turn to the whole problem. Lorentz had based his explanation on the concept of an ether filling all space and consequently of an ether-wind blowing through every experiment.

Einstein said that if the laws of nature are to be the same through-out space, all the various rockets or bodies moving through space, with different speeds must have different local times and there is no evidence that any true time exists which is superior to them all. True time implies the existence of body at rest in space. But such a thing does not exist. Before Einstein's discovery, ether was supposed to be a kind of matter whose only function was to act as a substratum for electrical fields, which by their very nature were not further analysable. The ether was only accepted as the seat of all operations of force which make themselves effective across space. Since it had been realised that electricity in motion produces a magnetic field, whose energy acted as a model for inertia, inertia also appeared as a field action localised in ether, in other words, fields were found to be physical conditions of space, for, if no particular state of motion can be ascribed to the ether, there does not seem to be any ground for introducing it as an entity of a special sort alongside of space.

Then came the special theory of relativity with its recognition of the physical equivalence of all inertial systems. From this time, space and time were merged in a single continuum in the same way as the three dimensions of space had been before. Physical space was thus increased to a four-dimensional space which included the dimension of time. The four-dimensional space of the special theory of relativity is just as rigid and absolute as Newton's space. For similar reason, perhaps, God (especially in India) is said to have four-hands. In the language of physics, after the discovery of the theory of Relativity objects have been changed into events and as there are no events without an observer, the modern physics has come to दृष्टि-सृष्टिवाद and has given up the सृष्टि दृष्टिवाद. From this time onwards, fields have been treated as inertial systems. These fields can now be compared to the क्षेत्रधर्म given in stansaz 5 and 6 of the 13th Chapter of the Gita and inertia system can be given the name of the Tamas. As inertia depends on the energy content, Tamas also depends, on the energy contents Therefore, Kali is worshipped in Bengal as a great Shakti. Kali also means the time-Spirit or the spirit of time. It has been known since ancient days that in order to describe the movement of a body a second body is needed to which the movement of the first is referred. The movement of a vehicle is considered in reference to the earth's surface, that of a planet to the totality of the visible fixed stars. In physics, the body to which the events are specially referred is called the co-ordinate system. The laws of mechanics of Galileo and Newton, for instance, can only be formulated with the aid of a coordinate system. A co-ordinate system which is admitted in mechanics is called an inertial system. The state of motion of an inertial system is according to mechanics not one that is determined unambiguously by nature. On the the contrary the following-definition holds good:– A co-ordinate system that is moving uniformly and in a straight line relatively to an inertial system is likewise an inertial system. By the "special principle of relativity", is meant the generalisation of this definition to include any natural event whatever. Thus every universal law of nature which is valid in relation to a co-ordinate system C, must also be valid, as it stands, in relation to a co-ordinate system C' which is in uniform translatory motion relatively to C.

The second principle on which the special theory of relativity rests is the "principle of the constant velocity of light in vacuo". This principle asserts that light in vacuo always has a definite velocity of propagation independent of the state of motion of the observer or the source of light. The special theory of Relativity succeeded in reconciling both the above principles logically by modification of the laws relating to space and time. It became clear that to speak of the simultaneity of two events had no meaning except in relation to a given co-ordinate system and that the shape of measuring devices and the speed at which clocks move depend on their state of motion with respect to the co-ordinate system. This means that human world is true for a human measurement but the human measurement may not be true. It changes in dream or when a man is drunk or when he is angry or passionate.

As mentioned above, the inertia of the system depends on the energy content and this leads to the notion that inert mass is latent energy. The principle of the conservation of mass lost its independence and became fused with that of conservation of energy. According to the new theory the geometrical behaviour of bodies and the motion of clocks depend on gravitational fields.

The theory of Relativity has been tested in the following three experiments:–

1) In the revolution of the eclipses of the planetary orbits round the sun (confirmed in the case of Mercury.)

2) In the curving of light rays, by the action of gravitational fields (confirmed by the photographs of eclipses).

3) In a displacement of the spectral lines towards the red end of the spectrum in the case of light transmitted to us from the stars of considerable magnitude.

The chief attraction of this theory lies in its logical completeness. If two bodies are of equal value for the filling of one interval they will also prove of equal value for the filling of other intervals. The interval is thus shown to be independent of the selection of any special body to fill it; the same is universally true of spatial relations. This concept of the interval is the starting point of the whole concept of time and space; in other words, the structures of the time space are not absolute, their structure depends on physical influence. When we consider psychological time-space, their structure depends on psychological influences.

Therefore, if we want to study nature, we must study the relation between nature and ourselves. Sir James Jeans says that "we only started on the right road, since the discovery of the theory of Relativity in 1905. This science has discovered that nature standing by its own strength, was an assumption rather than an acertained fact and that apart from the soul, this physical world in the proper sense does not exist. We used to think of space as something real and objective in the reigon "out there" from which messages came to our senses; It even seemed to acquire a sort of substantiality from the ether which we imagined to occupy its energy point. We thought of time as something equally real and objective, flowing past our senses in a way entirely beyond our control; yet when we question nature through our experiments, we find she knows nothing of either a space or of a time which is common to all men. When we interpret these experiments in the new light of the theory of Relativity, we find that space means nothing apart from our perception of objects, and time means nothing apart from our experience of events. Space begins to appear merely as a fiction created by our own minds, an illegitimate extension to nature of a subjective concept which helps us to understand and describe the arrangement of objects as seen by us while time appears as a second fiction serving a similar purpose for the arrangement of events which happen to us. "(New background of Science page 97)".

If we have to study objective nature, we require an objective frame-work. It is a four-dimensional space having X Y Z and T for its four co-ordinates. These co-ordinates include an observer. But when the individual space and individual time of any particular individual are welded together in this way, the individual is found to drop out altogether--the constituents are subjective to a particular individual, but the product is objective. If this is properly understood, we can know the reason why we see the objective nature. Each one of us may divide the four dimensional space into individual spaces and times in as many ways as we please. The relation between one man's space and time and another man's space and time or between the two spaces and times the same man may select for himself on different occasions can be found in the principles of the theory of Relativity. This science has proved that although beings who are travelling at different speeds relative to one another will naturally divide up this four-dimensional space in different ways, they will all find the same laws of nature. In other words, nature herself has no special way of dividing it up. She is concerned only with undivided four-dimensional space, in which she treats all directions equally. An object which was formerly characeterised by continuity of existence in time may now be treated as a continuous succession of events, each event being the existence of the object at one instant of time and one point of space. If a dead man were to come to life again and in the meanwhile if our calendar is changed, he will begin his life with a new time-space continuum. The whole of the physical nature follows us like a rainbow or like our own shadow. Modern science frankly says its subject of study is primarily our observation of nature, not nature alone. Length, time and mass etc. are not facts but relations between the observer and the event. This universe of ideas is just as little independent of the nature of our experiences as clothes are of the form of the human body. This subject will be more clear by considering some examples pertaining to it.

Example I.

There is a tower in the middle of Ahmedabad. If I go there at 12 noon, I hear the clock striking 12. If I go there next day, I hear the same bells at the same place. But if after hearing the first day's bells, I go on the sun, the tower will strike from a distance of about 1,50,0000 miles because the earth is travelling round the sun at the rate of about 18 miles per second. But while remaining in Ahmedabad, it is difficult to know this distance because all the events on the earth are taking place on the earth, i. e. they are subjected to the same time-space measure. Appearances are peculiar to each perspective i. e. an appearance is owned by a perspective and it is not possible for an observer in another state to share this ownership, in other words, alternative perspectives are very similar to the alternative systems of space and time. Distance is defined by certain operations of measurement and not with reference to non-sensical conceptions such as the amount of emptiness between two points. Each observer is perfectly consistent in his measurements of time and space so long as he confines his observations to his own system but when he tries to make observations on another system moving past his, he will find that the results which he obtains do not agree with those obtained by another observer.. There is no background of points in space against which motion can be measured in absolute terms and consequently no absolute flow of time against which intervals of time can be measured. Einstein has proved that all times are local. There are as many local times as there are rockets or planets or stars moving through space and none of them is more fundamental than the other.

Example 2.

It one man throws a ball towards another man at the rate of one minute a mile, the other man will not be able to catch it but if both of them are sitting in a train which is running at the rate of one minute a mile, and the first man gives the same ball to another man slowly, the other man will be able to catch it, although the ball is moving with the train at the rate of one minute a mile, as seen from the point of view of the station master. In this case all the phenomena in the train are affected by the motion of the train and therefore the events in the train take place as if the train is not moving. A new frame of time-space is created according to the system of reference. The theory of Relativity provides a stand-point in which the centre of interest is shifted to qualities possessed by the system as a whole. The determinism of the physical laws simply reflects the determinism of the instrument of measurement or the method of inference. Given two events A & B in different regions, it might happen that according to one convention they are simultaneous, according to another, A is earlier than B, and according to yet another, B is earlier than A. No physical facts correspond to these different conventions.

Example 3

We should appreciate the tremendous transformation in the attitude towards ourselves and nature which the substitution of the two termed epistemic correlation for the traditional three termed relation of appearance entails.

The event which is knowledge, is a purely naturalistic interaction between one factor in the aesthetically immediate theoratically designate complex of things and other such factors.

All combined become an event in a given field.

Example 4

Supposing there are two trains as follows i. e. train No. 1 is standing still and No. 2 is running in the right direction:—

Train No. 1. A P B

Train No 2. A' P' B'

A Passenger at P reported that two lightning bolts hit the ground at the points A and B which are equi–distant from him. A passenger at P' in the second train saw the flashes in succession i. e. he saw the flash at B' earlier than the flash at A' because his train was in motion. It has been stated above that the rate of time varies with different co-ordinate systems so that t=t'. If an event is taken as a bearer of such properties, it ceases to be a single entity because there are many sets of size, shape and date which it furnishes relatively to different stand-points of observation. Neither size nor date which are variously determined by different observers should be taken as intrinsic properties of an event, because the event of which various manifestations are observed consists of as many acts as there are observations. It is difficult to define an event as a single act because, there are alternative sets of characteristics attributable to the same event and that the choice of the alternative set depends upon the selection of the point of view; in other words, there are as many acts as there are observations. If we continue looking at the same spot, our attention invariably weakens, which brings forth some alteration in the sense datum and this is equivalent to saying that there is more than one perceptual event. The mistake lies in taking our percepts to be the physical world. Philosophy and the new physics say that the physical world cannot be indentified with our percepts.

Example 5

In the rainy season, we often hear some noise in clouds and at the same time observe flashes of lightnings. In the sky, the noise and the flash take place at the same time owing to the collision of the clouds- but as experienced from the earth, the flash of light is seen first and noise is heard afterwards because light travels faster than sound. In this instance, simultaneity and succession have been found to be relative.. Space-time order as well as space-time points result from the relations between events. The old view was that there is one cosmic time and that given any two events in any two parts of the universe, either they are simultaneous or the first is earlier than the second or the second earlier than the first. It was thought that the time order of the two events must always be objectively definite, although we might be unable to determine it. We now find that this is not the case. If light travelling from the place of the one event to the place of the other event arrives at the place of the other event after the other event has taken place and conversely, then there is no definite objective time order of the two events as earlier than the other nor yet for regarding the two as simultaneous; ideally careful observers will judge differently according to the way in which they are moving. This time is not cosmic but is individual and personal for each event. The physical world is a four dimensional continuum of events instead of a series of three dimensional states of a world composed of persistent bits of matter.

In other words, there is no absolute distinction between motion and rest because there are alternative systems of space and time and a particle at rest in one of them may be moving in others; thus the difference between unaccelerated and accelerated motion is likewise relative to the system of reference

One American author Ushenkó writes in his philosoophy of relativity (page 23) that "no physical event which is self—experienced can experience its own boundaries, for this would be a discrimination between itself and the external world which would require consciousness. While to an outsider an event occupies a finite area, to itself, it feels spatially unbounded. It is even easier to understand that there is no self-experience of limits of duration because no event outlives itself and it is only through self-surviving that it could comprehend its boundaries of time." We do not know exactly when dream begins or at what time we go to sleep. Even in waking condition, when the same mistake takes place, it is not possible to know exactly at what minute the mistake took place, because the time of mistake and the time of search are different. When the description varies with the change of perspective, it may be said to be a distorted account of nature.

Besides, in the waking condition, according to the modern science, size, shape and mass, which would condition the same-ness of substance are relative properties which means that they vary with the change of perspectives and therefore cannot determine unambiguously the identity of a physical substance. A perceptual event does not last long; the act of perceiving introduces alteration when prolonged beyond certain limits. There is no correlation between perspectives. If a perspective is a set of appearances from and at a station point, any other station point is beyond this perspective and so is the correlation between the diffrent station points.

Time and space are not the simple things we take them to be but are pregnant with mystery. The value of Einstein's work in proving the truth of relativity by physical facts instead of by metaphysical reasoning is immense. After this discovery, the universe requires constant re-interpretation. The entire principle of relativity raises a gigantic question-mark against all our experiences of the universe and hence against all our definiteness of knowledge. An observation may be quite true when it is the consequence of fixing our attention on any particular point of view in the realm where relativity reigns and yet it may not be the truth in itself. We are living in a world where reason does violence to experience, for instance. the earth is round yet appears to be straight. Water thrown on a round ball gathers on one side only and yet the waters of the oceans of the round earth do not turn on one side. This means that the fact itself depends on the stand-point from which we approach it. The sight of one aspect excludes all the others. The wide discrepancy between experience and truth of experience compels us to press onward beyond the fact to reflection upon the fact.

Example 6

When a train is going from one station to another and if the gradient is lower, the speed of the train naturally increases; if the gradient is higher, the speed naturally decreases. Therefore, time-tables are adjusted according to the gradients. Here time depends on the nature of the space. A duration is itself an act of self-experience which being the private aspect of an event is incommensarable with any other event. According to the principle of relativity, time stands on the same level as space. Therefore, each measurement is an idividual event standing by itself; as such, it is determined by special circumstances, especially by a definite place and a definite time but also by a definite measuring instrument and by a definite observer. A gravitational field or any other field of force may be eliminated by choosing an observer moving with the proper acceleration. If one is moving with an acceleration with reference to the other, his path in the four-space will appear curved to the other though he himself, since he regards it as his time axis will still assume it to be straight. We cannot determine whether the universe as a whole is at rest or in motion and may as well make one guess as another, only the relative motions of its parts can be detected or studied. There is no back-ground of points in space against which motion can be measured in absolute terms and consequently no absolute flow of time against which intervals of time can be measured. Railway time-tables are based on one method of calculation but they do not guarantee that the trains will always start and arrive according to those time-tables. Even if the trains run exactly according to the time-tables, that time is made to fit in with human requirements. There are as many local times as there are rockets or planets or stars, moving though space and none of them is more fundamental than the other. The ingredients of nature are not objects existing in space and time, but events in a continuum. An object which was formerly characterised by continuity of existence in time may now be treated as a continuous succession of events, each event being the existence of the object at one instant of time and one point of space. Thus an object is associated with a continuous succession of points i.e, a line in a continuum. This is commonly called the world-line of the object, its shape and position representing the motion of the object throughout its whole existence. Russell says that if this sharp line of past, present and future disappears, the concept of evolution in time may lose all meaning. The pattern is not being continuously woven piece after piece in a time which no longer exists but is spread before us complete in a continuum in which future events have just the same kind of existence as past events.

Example 7

Supposing, a ticket examiner is examing tickets of passengers in a corridor train which is running at 60 miles an hour. The ticket examiner may be moving in the train towards the engine side at the rate of 5 miles an hour, but if he is observed by a station master standing outside the train at road-side stations, the ticket examiner will appear to be moving at the rate of 65 miles an hour, i. e. 60 miles speed of the train, 5 miles speed of the examiner. If the ticket examiner be moving towards the guards van, he may appear to be moving at the rate of 55 miles an hour as seen by a station master from the station through which the train may be passing. This means that things are not actually located in time and space but messages from things which reach our sense-organs travel through time and space. It is stated in the Yoga Vasistha that the whole of the past is a thought and the whole of future is also a thought. The mistake lies in taking our percepts to be the physical world. Modern science and the Indian philosophy teach us that the physical world cannot be indentified with our percepts. There are as many acts or events as there are observations. In the case of dreams, the utter impossibility of referring its events to the same time series as the waking becomes more apparent. It is impossible to locate an event in an objective way as to locate an object in space in an objective way. What is a certain time for one body in space is another time for another body in space.

B. Russell says that all adaptation to environment acquired during the life of an individual might be regarded as learning to dream, dreams that succeed rather than dreams that fail. The dreams we call waking perceptions have only a very little more resemblance to objective reality than the fantastic dreams of sleep.

One man got a dream. He gave his experience as follows:—"I was asleep on my bed in a hotel in Bombay, my sleep was a deep one, so deep that when I woke from it, I could not remember where I was. I had travelled a good deal, living in a number of places and as I lay with my eyes still closed I found myself struggling to lay hold of the continuity of life and to remember whether I was in Calcutta, Madras, Delhi, or Lucknow. After a moment, the knowledge comes to me, " I am in Bombay. This body lying beside me (for so it seemed at that moment) on the bed, this thing called me " that I accept as me " that is in Bombay. I opened my eyes; the body became me and I was in Bombay He continues —

" In waking life also, I am where I have always been viz. with God, no matter where one's material body may be, the true self remains where it has always been."

☆

CHAPTER 7.

The Nature of Atoms

Upto the 19th century it was found that there were about 92 chemical elements in the physical world. Every element contained some atoms for instance, a molecule of water contained two atoms of hydrogen and one atom of oxygen. Iron contains 55 atoms, silver I07, Gold 197, mercury 200, radium 225 and uranium 238.

Subsequently it was found that matter had the power to give light. This was called radiation. Moreover, in the twentieth century, a discovery was made not only to bombard atoms and break them but to change one kind of atom into another kind. In 1911, Rutherford discovered that an atom is a kind of solar system having at its centre a proton and having several electrons circling round the central proton. The discovery of X Ray and radio-activity also proved that the atom was a complex structure made of still smaller units,. which were subsequently called electrons. The central positive particle was given the name of proton and the circling negative particles were named electrons. The central proton was found to be much heavier than the electrons.

There is no such thing as rest in the world of molecule, atom and electron. It is now known that the infinite variety of solid materials is merely the expression of the infinite variety of ways in which atoms and molecules can be joined together.

In the closing months of the nineteenth century Prof. Max Planck of Berlin brought forward an explanation of certain phenomena of radiation. He said that there was atomicity of radiation and that the course of nature proceeded by tiny jumps or jerks, like the hands of a clock. In other words, radiation was not discharged from matter in a steady stream–like water from the hose but rather like lead from a machine gun; it came off in separate chunks which Planck called quanta.

This discovery of quanta carried with it tremendous philosophical consequences. The theory of Relativity had great bearing on the time-space problems of philosophy as it enabled us to study large scale phenomena with great accuracy, so the quantum theory of Planck enabled us to study the small scale world with great accuracy. Subsequent discovery made by Rutherford and Soddy showed that radio-active substances broke up spontaneously without a cause. The result of this discovery was that discontinuity marched into the world of phenomena through one door and causality walked out through another door. Planck found it necessary to postulate an infinite number of kinds of quanta or atoms of radiation, one for every length of wave. The energy contained in an atom or quantum of radiation is large when the wave length is small and vice versa. This can be seen by those who are using radio receiving sets. The precise relation is that the energy is equal to H times the frequency of its radiation, this being the number of complete wave-oscillations which occur at any specified point in a second or again the number of complete waves that pass over the point in a second.

Subsequently Einstein proved that each emitted quantum was travelling through space in the form of a compact and indivisible unit, an unbreakable packet of radiation. Such a packet he called a light arrow or photon. A similar method for world-construction appears in the Indian philosophy as given by in the Vaisheshic Darshan by Kanad in which he says the world is created from a bundle of atoms (परमाणु).

Subsequently a good deal of evidence has been found which shows that light does not travel through space in the form of these unbreakable units, but in the form of waves. It has been found by subsequent experiments that light is sometimes found to consist of particles and sometimes of waves. When radiation is falling on matter it shows itself as a particle and when it is travelling though space it shows itself as a wave. These are not two different things but two aspects of the same thing. As soon as light shows the properties of particles, its wave properties disappear and vice-versa; the two sets of properties are never in evidence at the same time.

A molecule appears to remain steady at a particular temperature or at a particular level. To lift it to the next higher state or level, a definite supply of energy is required. The heat required depends on the energy difference and the intesity of the heat motion. The heating results in a quantum jump which leads to an essentially different configuration of the same atoms. The molecules of any substances which a chemist is able to isolate at a given temperature must at the temperature have some kind of duration. This depends on the quality of the temperature.

A living organism in order to avoid decay must maintain heat by eating, drinking, breathing and talking. We shall now examine some of the results of heating inorganic and organic substances. One of the best known results of heating inorganic substance is the bombardment of the atoms of uranium and producing therefrom the famous atom bomb. It has been possible not only to derive energy from radiation but it has been possible to change matter into energy and energy into matter. A volume of water can be changed into ice or can be changed into steam.

Image Worship.

Any system which is capable of vibration is set into vibration when it is disturbed from outside. If the disturbance finally fades away or is withdrawn, the system does not come to rest immediately, but continues to vibrate for a time. The vibrations which it now executes are known as the full vibrations of a system and the periods of these vibrations are described as the free periods of that system. The air in a concert hall has innumerable free vibrations, their wave-lengths ranging from the whole length of the concert hall down to minute fraction of an inch. Thus we have two pictures-the wave picture and the free vibration picture. If we apply this example to the worship of an idol in a temple by means of light and sounds, it is easy to understand that the radiation of light waves and vibrations of sound waves affect the atoms of the idol. Afterwards the idol begins to vibrate automatically. As stated above, every atom contains electrons which are in the nature of waves. If worship is done in a proper way these waves are set in motion. In other words, the idol may be found to be pulsating. Afterwards, when the mind of the worshipper is attuned to the idol, several kinds of new experiences are possible. In this connection, Aldous Huxley writes in the Perennial Philosophy (page 304) that if sacramental rites are constantly repeated in a spirit of faith and devotion, a more or less enduring effect is produced in the psychic medium in which individual minds bathe and from which they have so to speak, been crystallised out into personalities more or less fully developed according to the more or less perfect development of the bodies with which they are associated. Within this psychic medium or non-personal substratum of individual minds, something which we may think of metaphorically as a vortex persists as an independent existence possessing its own derived and secondary objectivity so that wherever the rites are performed, those whose faith and devotion are sufficiently intense actually discover something "out there" as distinct from the subjective something in their own imaginations. And so long as this projected psychic is nourished by the faith and love of its worshippers, it will possess not merely objectivity, but power to get peoples' prayers answered. It would, of course, be a mistake to imagine that this presence is the presence of that God who is a spirit and must be worshipped in spirit; it is rather the psychic presence of men's thoughts and feelings about the particular, limited form of God, to which they have resorted according to the impulse of their inborn nature-thoughts and feelings projected into objectivity and haunting the sacred place in the same way as thoughts and feelings of another kind, but of equal intensity haunt the scenes of some past suffering and crime. The presence in these consecrated buildings, the presence evoked by the performance of traditional rites. the presence inherent in a sacramental object, name or formula all these are real presences, but real presences, not of God or the Avatar but of something which though it may reflect the divine Reality is yet less and other than it. If ritualistic white magic is regarded in itself true religion, if the real presences it evokes are taken to be God in himself and not the projections of human thoughts and feelings about God or even about something less than God, and if the sacramental rites are performed and attended for the sake of the "Spiritual sweetness" experienced and the advantages conferred–then there is idolatry."

During the image worship in the temples, especially in India, a lamp is lighted by means of ghee which is an organic substance, and the light coming out from the wicks is moved round the idol in such a way that the waves of the electrons inside the idol move upwards and outwards i. e. in all directions, so that they begin to mix with the waves of the light used by the worshipper. After the ceremony is over, that light is passed on to the visitors, who have come to the temple for Darshan. At some places, for instance at Nadiad in Gujarat, a continous burning lamp is kept, the idea being that it will gather together the divine influence left there by a past saint who has been buried there. All these examples prove that heat or radiation plays an important part in changing one substance into another in physics as well as in religious worship.

Atomic energy in food grains.

During the monsoon season specially and in other seasons also. cultivators sow seeds of grains in the fields. When these grains get the heat of the earth and the sun and when that heat is controlled by the water or rains, the atoms of the grains become radiated and innumerable grains are produced from a few small seeds. These grains are again heated when being powdered. The particles of the flour again get heat on the bakery when the flour is baked and changed into bread. The particles of the bread are again heated by the warmth of the stomach when the bread is eaten. Raw grains are eaten by the birds but their internal heat is sufficient to change these matters into energy. When the heat given by the food digested is more or less or when there is some disturbance, the man becomes sick and he has to be cured by medicines which contain different kinds of atoms which may be sufficient to give the required heat

Particles of medicines

The dose of a medicine is always smaller than the food taken. In order to maintain heat at a proper level, a sick man is sometimes asked to undergo a fast. The fast cures the disease by generating the necessary heat and expelling from the body foreign matter. In some cases, homeopathic and biochemic medicines are given. Although the particles of the atoms in these medicines are small, they have tremendous power of radiation because each atom contains many election. Among Ayurvedic medicines, there are some small medicines like Abhrak Bhasma, with 1000 "puts" (coverings). It is a small medicine but gives a marvellous effect. It works like an atom bomb in the body and destroys many unnecessary foreign elements in the body. One man's heart disease was cured by giving the biochemic medicine kali phos. 1000

Birth of a man

A man is also born from a mere drop of fluid. The hydrogen and oxygen atoms of this fluid contain electrons. When these electrons are affected by the heat and particles of the female body, a new atomic form is produced from which a human body is formed. When the child grows up, he gets the power of thinking. Thinking also produces a certain kind of heat. Right thinking leads to salvation. To lift up a molecule to the next higher state or level, a definite supply of energy is required. This is called heating up or Tap (तप) in the Indian language. This means that we must try to bring the self into an environment of higher ideas when a definite change is required.

The Atom Bomb.

The theory of relativity has proved that mass and energy are one and the same thing and that a small mass is enormous when translated into energy–terms so that a mass as tiny as an atom has a tremendous amount of energy, the multiplying factor being C^2, the square of the velocity of light. So long as M or mass is constant as for elastic collision, energy will also remain unchanged. But in the case of inelastic collision, M and therefore E will change and this is the situation when an atom is split up, for then the sum of the masses of the parts is less than the mass of the original atom. When uranium atom was bombarded with neutrons, this atom split up into two nearly equal parts whose combined mass was less than the mass of the uranium atom itself, this loss in mass being equivalent, as the Einstein formula has shown, to a tremendous amount of energy, thus released by the fusion. The following will be some of the results when this energy will be brought under full control;—

1. It will be possible to make a non-stop flight round the earth in 24 hours.
2. Planes carrying several thousands passengers with sufficient space will make a non-stop flight from New York to India or Australia.
3. There will be no war for oil.
4. There will be cheaper cost of production
5. There will be a vast use of the atomic machinery.
6. The old dream of the alchemist to turn base metals like iron and lead into gold may become true.

7. It will be possible to mine the minerals remaining at the bottom of the oceans.
8. Sunshine or cold will be available in any given area, such as a park or bathing ghat, irrespective of whether the sky is full of clouds or not.

Atom smashing experiments were made during the years 1920 and 1930 by means of cyclotrons. These experiments gave a vast amount of knowledge about the structure and behaviour of atomic nuclei. In 1939, atom smashing took a new turn. It was then found that Uranium 235 would release a tremendous and almost unbelievable amount of energy. Whereas a radium atom merely expelled a particle or two from the nucleus, the atom of of Uranium 235 splits in two.

But all these experiments relate to statistical laws i.e. where there are many electrons or where there are many atoms. We shall examine in the next chapter what an electron really is i.e. how it appears individually.

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CHAPTER 8.

Particles And Waves of Light

As stated in the last chapter Planck discovered in 1899 that there was atomicity in radiation. These are called quanta. The quality of these quanta depends on the wave-length and the frequency. Planck found that an atom could only emit radiation by complete units or quanta. Afterwards Einstein pictured each emitted quanta as travelling through space in the form of a compact and indivisible unit i. e. an unbreakable packet of radiation. Such a packet he called a light arrow but it is now called a photon.

According to this picture, a stream of radiation may be visualised as a shower of photons. When this falls on a material surface, like a hail of arrows hitting a target, each photon will hit one of the electron in the surface and will do damage which is confined to the point of contact.

Subsequently it was discovered that radiation was in the nature of particles as well as waves. The particle picture is more suitable when radiation is falling on matter and the wave picture when it is travelling through space. In making observation on nature as also in the more general activities of our everyday life, the universe can be supposed to be divided into two detached and distinct parts, a perceiving subject and a perceived object. The theory of Relativity first showed that this cannot be entirely so; the picture which each observes makes of the world is subjective. Even if the different observers all make their pictures at the same instant of time and from the same point of space, these pictures will be different unless the observers are moving together at the same speed; the picture depends both on what an observer sees and on how fast he is moving when he sees it.

The theory of Quanta shows that every observation involves the passage of a complete quanta from the observed object to the observing subject and a complete quanta constitutes a not negligible coupling between the observer and the observed. Complete objectivity can only be regained by treating observer and observed as parts of a single system; this constitutes an indivisible whole, which we identify with nature, the object of our study. This does not consist of something we perceive but of our perceptions; it is not the object of the subject-object relation but the relation itself.

It is also stated in the Budha-religion that there is no permanent point of reference. What we see are relations without anything related.

When a physicist tries to follow the motion of an electron inside an atom, he can only obtain knowledge of the internal state of the atom by causing it to discharge a full quantum of radiation. In these circumstances, the whole motion of the atom is changed and the result is practically a new atom. Every departure of the quantum breaks the continuity. For this reason it is futile to discuss whether the motion of the atom conforms to a causal law or not. The mere formulation of the law of causality presupposes the existence of an isolated objective system which an isolated observer can observe without disturbing it. But as there is no sharp distinction between the observer and the observed, any observation he makes must influence the future course of the system.

Causality comes in existence when there are immense number of photons or electrons. Therefore, on the man-sized scale, nature appears to be deterministic; like causes produce like effects. With single quantum, the case is diffrent.

In the years 1927, Professor Heisenberg showed that the concept of the quantum theory involved what he called the principle of uncertainty. He said that if we know that an electron was at a certain point in space, we cannot specify exactly the speed with which it is moving. In the same way if we know the exact speed of motion of an electron, nature refuses to let us discover its exact position in space. The uncertainity to which Heisenberg has called attention is partially but not wholly of a subjective nature. The result of this discovery has been that the determinism in large-scale events is found to be of a statistical nature. When a beam of light is recduced to a single photon, it must follow either one path or the other, it cannot distribute itself over both because the photon is indivisible. And its choice of path proves to be a matter of probability, not of determinacy. Thus we cannot reason about light, only about the result of our experiments with light. Just as the theory of Relativity had removed a whole mass of inconsistencies and contradictions from large scale physics and astronomy, creating hardly a single new difficulty in their place, so Heisenberg's new line of thought has performed a similar service for atomic physics.

The present science has dismissed three concepts from its scheme viz. absolute space, absolute time and the ether. These concepts have affected the atomic physics also viz. the motion of electrons. The wave length of an electron is determined by the speed of the travel of a shower of electrons; this shows that the waves cannot have any objective existence when the shower is travelling through empty space. For under these conditions "speed of travel" has no meaning at all, this of course is the main message of the theory of relativity. It must have some field including the observer. As soon as a shower of particles encounters matter of any kind or any electric field, this provides a frame of reference against which the speed of motion can be measured and the expression "speed of motion or momentum of a particle" acquires a definite meaning.

Whatever an electron may be, it must be supposed to confirm, like the rest of nature to the theory of Relativity. This shows that it is meaningless to assign to an electron properties which can be specified in space alone, this description must involve time as well and the position of the observer. In this way, electron waves become reduced to a more diagramatic representations of probabilities.

The most refined piece of information we can obtain about any piece of the universe is that conveyed by the arrival of a single photon.

This transfers to our instrument energy and momentum which it has brought with it from the fragment of the external world in which it originated. Just as a shot gives a backward kick to the gun from which it is fired, so a photon gives a backward kick to the atom which sends it out and through this atom to the fragment of the universe which we are trying to study. Thus it may give us accurate news of the universe as it was, but the kick it gave to the universe in leaving it to bring us news, makes the news out of date before it reaches us; we receive news only of an old universe which has already passed away. Heisenberg's uncertainty principle shows that so long as we can only explore nature by complete photons, there is no hope of obtaining information which is perfectly exact with respect to both time and space.

When we regard an electron as a system of waves, their wavelength depends on the speed of the electron. The problem of measuring this speed with exactness reduces to that of specifying a wave length with exactness. Abstract mathematics shows that this cannot be unless we have an infinite number of waves at our disposal. With fewer waves, the concept of wave-length has not exact meaning. If we have a million waves at our disposal, we can measure their wave-length to within something like a millionth part of its amount, but to speak of measuring it more accurately than this is meaningless. Let us suppose that there are wireless waves and that we allow them to fall on an ordinary wireless receiving set which can be tuned to any wave length we please. Any train of waves will set up disturbance by resonance over a wave-band of finite width. As we lengthen the train of waves, the interference with the neighbouring wave-lengths diminishes, but it does not completely disappear until the train of waves is made infinitely long. Only then we can say that the waves have a clearly defined wave-length. This shows that we cannot specify the speed of motion of an electron with perfect precision unless it is represented by an infinite train of long-waves. But since we have seen that the waves represent the probabilities of finding the electron in different positions in space, the electron may be anywhere along the whole-length of the train, and an infinitely long train of waves implies an uncertainty of infinite amount as to the position of the electron. We now pass to the other extreme and imagine an infinite short train of waves to pass over the receiving set. The set sees nothing in such a train of waves but a mere sudden disturbance which disappears the instant it has come into being. As every wireless expert knows such a disturbance affects all wave lengths indiscrimately and so cannot be said itself to have any definite wave length. An infinitely short train of waves of this kind represents an electron whose position can be specified with precision but we see that its wave length and so also the momentum and speed of its motion are completely indefinite. This means that greater precision in momentum implies greater uncertainty in position and vice-versa.

If we apply this science to philosophy, we can say that when a man knows himself as Brahma, the Absolute i.e. existing everywhere, he cannot find his position and when he knows himself as an individual existing at a place, it is not possible to find his speed i.e. he cannot then be known as the Absolute. The particle picture and the wave picture lead to the same "principle of uncertainty." This means that when we use the particle picture of an electron, the uncertainty refers to the knowledge of nature we obtain through experiments on nature. When we use the wave picture, we find that the uncertainty is inherent in the picture itself. In brief, the particle picture tells us that our knowledge of an electron is indeterminate, the wave picture that the electron itself is indeterminate regardless of whether experiments are performed upon it or not. We must, therefore, suppose that the wave picture provides a representation not of objective nature but only of our knowledge of nature. This is called Gnat Satta (ज्ञातसत्ता) in the Vedant philosophy. There are as many wave pictures as there are ways of knowing them. The same electron may be represented by two different wave pictures, not because it is itself different in the two cases, but because our knowledge of it is different in the two cases. Thus the waves represent subjective probabilities. The waves we describe as light waves and those which we interpret as the waves of an electron or a proton consist of knowledge, knowledge about photons, electrons or protons.

If we ask a modern physicist "What is an electron," he will ask us "What do you know about an electron?" We state what we know and and then he replies that "that is an electron" i.e. there is no electron apart from our knowledge of the electron. In the same way, in a Vedant class, if a disciple asks his Guru (master) "what is the nature of the world?" the master replies "What do you know about the world"? The disciple states what he knows and then the master says "that is the world." There is no world other than what we know about the world. Heisenberg's discovery has shown that the real electron has a greater complexity than mere position in space; if we know that its total energy has a certain value and try from this to find its position in space, the complexity of its wave pattern shows how many answers we may receive to our question.

We may regard this wave pattern as representing the projection into space and time of all the configurations which have a given total energy. If we limit our view to events which affect our senses, we obtain a system of waves which is completely objective in the sense that we must imagine them existing. But the waves, in themselves do not admit of representation in space and time and so cannot be said to possess any physical reality unless they are brought in a system. This picture appears as a clumsy approximation to truth, an approximation obtained by trying to force into a frame-work of space and time a structure which does not admit of repre-sention in space and time,

Our knowledge of the external world is brought to us by photons which travel in a setting of space and time with the result that from our earliest days, we have thought of objective nature itself as also existing in space and time. Our thoughts have become space-time bound and can get no grip on concepts outside space and time. When we are discussing an assemblage of an immense number of photons, then, of course, the wave–equation will shew that there was complete determinism in respect of the special phenomena in question. This being so, there is no assignable reason why the apparent determinism of wave-equation should not conceal a complete objective indeterminism.

The classical theory represented nature as situated wholly in time and space and at the same time governed by strict determinism. The newer theories shew that we can retain either the space–time representation or the strict determinism but never both. Our space-time frame work proves inadequate for the representation of the whole of nature.

Sir James Jeans says that space-time is not the frame work of the world of nature but of the world of our sense perceptions.

The subject of study for modern Science, therefore, is not nature itself but our observation of nature. Our supposed laws of nature become a mere specification of our own mental processes, telling us little or possibly nothing about nature but certainly something about ourselves. The electron waves have no material or real existence apart from ourselves. They are not constituents of nature but only of our efforts to understand nature. Different kinds of wave-packets must not be supposed to represent different kinds of electron or electrons in different states or electrons under different conditions but the different kinds of knowledge we can have about electrons.

If some one raises the question "What happens to the waves when there is no human knowledge to represent?" Present Scientist answers that when there is no human knowledge, there are no waves; therefore causality disappears from the events themselves to reappear in our knowledge of events. A model or a picture or an event will only be intelligible to us if it is made up of ideas which are already in our minds. A mechanical model or picture must represent things as happening in space and time but modern Science has made it clear that the ultimate processes of nature neither occur in, nor admit of representation in space and time. As the wave picture consists of our knowledge of nature, the futurs does not follow from the present but the imperfection of our future knowledge follows inexorably from the imperfection of our present knowledge. In transcending space and time, the new quantum mechanics finds a new ground which makes for far greater simplicity and so comes nearer to ultimate truth. The space of observation is individual perceptual space and time is individual perceptual time. They have no existence outside the individual consciousness.

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CHAPTER 9

A man's relation to the world.

In the atomic theory of particles and waves, it has been discovered that electrons have the property of particles as well as waves. In 1927, the new quantum theory was formulated by Prof. Heisenburg. He proved that it was not possible to know the position, and speed of the electron at the same time. When we want to know its position, short waves have to be used and then it is not possible to know its speed which is enormous. When long wave quanta are used, we can find the velocity but we cannot find the position of the electron. The electron waves are therefore waves of knowledge, they do not give us a picture of the particle but of what we know as to the position or speed of motion of the particle. These waves of knowledge exhibit complete determinism, As they roll on, they show us, knowledge growing out of knowledge and uncertainty following uncertainty according to the strict causal law. But this tells us nothing which we do not already know. This is called Gnat Satta (ज्ञातसत्ता) in the Indian philosophy, i. e. the world is as big as our knowledge and lasts as long as our knowledge of the world lasts. This is proved in the dream condition. Modern science says that the experiences of the waking condition are of similar nature. The small hard atoms have now departed from science. Electric and magnetic forces also are not real, they are mere mental constructs of our own, resulting from our misguided efforts to understand the motions of particles. This is not a picture of reality but is a picture we draw to help us imagine the course of events in reality. This means that reality and knowledge are similar in their nature. Therefore, if we want to understand the truth, we must first put our knowledge in the right condition.

Some persons can argue that if the electric forces are mental constructs, why is a man burnt to death by an electric current? The reply is that a man's body is made up of such elements which are subject to destruction by electric currents but body is not the whole man. Causation and determinism is statistical. The individual soul is not affected thereby. As in dream, so in the waking condition. If the soul feels itself as one with the dream body or with the waking-body, he will be influenced by the conditions of that system.

Sir James Jeans writes that when we come to study the wave picture of the world, we find that photons (quanta of light) are no longer independent individuals but members of a single organisation in which their separate individualities are merged not merely in the superficial sense in which an individual is lost in a crowd, but rather as a raindrop is lost in the sea. The same is true of electrons. In the wave picture, these lose their separate individualities and become simply fractions of a continuous current of electricity. In each case, space and time are inhabited by distinct individuals, but when we pass beyond space and time, from the world of phenomena towards reality, individuality is replaced by community." As it is with light and electricity, so it is with life. This is proved in various ways by the Indian philosophy.

The phenomena may be individual carrying on separate existences in space and time, while in the deeper reality beyond space and time, we are all included in the one all pervading Brahman.

If a lady is sitting in a room and her father comes in the room, she feels herself as a young child. If the father goes out of the room and her son enters there, she feels herself as an elderly mother. If her son goes out of the room and her husband enters the room, the room assumes entirely a different picture for both. If the husband and the wife have met there for the first time after their marriage, their night passes very quickly. If the lady is very sick, her time pases very slowly. Within the conscious psychic life no hard and fast line can be found between subject and object but only a sort of a movement to and from a foreground object and a background subject. As the field of outer observation can be widened by movements or travels, so the field of inner observation can be widened by developing discriminative powers in this direction.

Considering from the point of ordinary vision outward forms of objects are visible things and our eyes are the observers. When we go inside, the eyes become the objects and mind becomes the observer. When we go further inside mind becomes the object and the witness soul becomes the observer. In ordinary sensual perception, the subjective side is reduced to a state of passive awareness, because it is more or less dominated by the object, with the result that the subject is thrown out of the field. The transition from the organic to the psychic spheres, is a transition from one periodicity to another. For associative memory, the space and time coherence of the sensual world will become discontinuous. The psychic can jump from one space or time to another. It has as many spaces and times as it has presentations because the latter are detached from the space and time continuity perceived by sensation.

In a subject which is limited to the space of immediate experience of the objects of the senses no consciousness of a world-space can arise. This consciousness is only possible when the subject is able to transcend the sphere of motion and sense altogether by means of self-movement in the psychic sphere. In that sphere, the subject will be able to produce space by imagination and therefore will be able to dissolve the continuity of world-space into the discontinuity of images or ideas ruled by the continuity of time. In the sensual sphere, the tendency is to fill space with concrete sensual experience; in the psychic, the tendency will be to empty it of all qualitative contents and consider it only as a spiritual substance. Apriori space is a constructive product of the subject which, therefore, as the producer must precede the product and cannot itself be spatial in the sense in which the body is so. While the subject as a sensual body is able to centralise itself in a body occupying a dimunitive part of the whole world space, it is as apriori able to produce the whole world space. Then the past and the future will become present. When the abstract exclusion of the higher dimensions is suspended, it is possible to reach every point in an object of one, two or three dimensions without passing through any point in the object itself. By sensation, we learn to know things in space. By mental activity, we learn to know space in things, gaining what we may call a power of ommipresence.

We are generally dominated by the events in which we take part. Their proximity, the fact that we are actors in a drama warps our perspective, prevents our embracing the phenomena as a whole and attributing to each event its relative value. Recent scientific investigations have made it clear that the world of sense experience i. e. of common sense is only a small part of the world as a whole. The very power to put questions to several experiences implies a stand-point of real independence so far as the question goes, because it implies the ability by ideal means to realise possibilities indepedent of sensual activities. By the perfect elimination of all dynamic co-ercive factors, free insight is made possible in which all dynamic activity is on the side of the subject. The infinity of the universe belongs to the spiritual, not to the physical part of it and the infinity of empty space is only an empty shadow of the infinity of possibilities belonging to spiritual existence. There is, therefore no need to go to the end of the universed to find its boundaries. They are four-dimensionally to be found everywhere within the physical universe. As a part in outer space considered apart from the subject, and its consciousness, a point within a three-dimensional body can only be reached by passing through othe points in it. But considered as a purely mental object-a product of constructive imagination-constantly connected with the activity of the subject, the case is different. It cannot be denied that consciousness ideally is present in every point of such an imaginative construction and can make any of these points the starting point of further geometrical constructions. The ideal cubic body is transparent not sensually but intellectually. It is penetrated through and through by the power of awareness belonging to consciousness which therefore has the power to single out any point in the continuity of formal space. By means of sensations we live in space, but by virtue of our conscious inner activity, space is in us. By sensation we learn to know the things in space. By mental activity, we learn to know the space in the things, thus gaining a power of omnipresence in formal space.

This inner and direct relation of consciousness to the objects of its activity i. e. its four-dimensionality may also in a modified form be attributed to life. If we remember that the life of an organism consists in its continuity and teleological unity-the harmonious co-operation of its different parts, life itself must be said to be directly present in every part and point of the organism. The various material particles or juices and energies must pass from point to point or part to part, but to life itself the co-ordinating unifying power, as it appears reflected to the inner sense in self-feeling every part seems directly accessible. It represents a continuity working within and by means of the discontinuity of the body. What is realised in consciousness as psychic transcendence appears in life as a sub-conscious directing immanence in the sphere of motion. But in both cases, a sort of four-dimensional continuity is actively realised within a discontinuity. This attitude will lead to realisation of cosmic unity. To the idea of simultaneity as such, motion ceases to have any significance as a means to become conscious of spatial extension as a totality. As with space, so with time. Time orders of velocities of succession, of which the psychic can have no direct experience can be made objects of thought. This is called TRIKAL DRASTI in the Indian philosophical language. The determining factor in this time order will be the time which we need to become conscious of the sensual or super-sensual impression. As sensual beings, we are immersed in a definite time order determined by organic and cosmic rhythms. But intellectually or in the abstract we are able to transcend this limitation by the calculation of other time-orders and their consequences. As possibilities, any other time order than our own is intellectually realisable to our mind.

According to the modern science, position and velocity are not definite quantities. Both are indefinite to some extent. In making any observation of a motion, you will necessarily disturb this motion. If you learn something about the motion of a body, this means that the moving body delivered some action on your senses or the apparatus you are using. Owing to the equality of action and reaction, we must conclude that your measuring apparatus also acted on the body and so to speak "spoiled" its motion, introducing an uncertainty in its position and velocity. The calculus of probabilities is nothing but the combination of rules which make it possible to express the laws of chance mathematically. Life and fire insurance companies are based on statistics which tell us how many men die or how many houses burn on an average per year. If there were only 10 policy-holders, all occupying the same house and if nine were killed by an epidemic or an accident, the Company will be bankrupt. When a hundred individuals are distributed in ten different houses, the chances of the Company are greater; for, it is unlikely that an epidemic or an accident will destroy the whole hundred. Social and political actions are also based on statistical laws.

Different creatures living in different time-space orders will have different laws. These laws will be broken when they acquire new time-space measures. Therefore, true human progress can only consist in perfecting and ameliorating man himself and not in improving the tools he employs nor in increasing his physical well-being. A number of schools insists more on history, forms, rites, dogmas, heresies than on the profound significance of religion. The teaching of history in the whole world, has for a long time been at fault, i.e. enemy country is always treated as in the wrong.

Besides, time as a spatial function is something different from time as a function of the perceiving mind. The "now" of the perceiving observer is sub-divided into a number of successive "nows" corresponding to different places (or points) occupied by the moving sense-object during its motion.

A simultaneous presence is only imperfectly realised by the psyche in physical space. In the formal space of intellectual intuition, it is perfect. In organic as well as conscious intentionality, a simultaneity embracing a past and a future acts as a directing presence in the succession of motional situations or psychic complications.

In the theory of relativity, we have not got to do with an extreme subjective relativism. The theory is physical. The nearest approach to omnipresence in physical or real space is light which can be used for physical definitions and determinations. But light has a velocity of 186000 miles per second and thus falls short of the timeless velocity which is necessary to realise a simultaneous ommipresence in space. But as time is relative, several good thinkers have tried to apply the theory of relativity in psychology. The constancy of the velocity of light is a weak point in Einstein's theory when we take into consideration the psychic factors. Even in physics, Prof. Milne has recently pointed out that we must first ascertain the clock of the observer. In formal space no velocity can be highest because formal space is only a possibility. Formal space or psychic space involves infinite possibilities of velocity as well as slowness. As life practically means an enduring simultaneous presence within the organism, as conscious perception means a simultaneous presence of the perceptive power within the field of perception so there must be a four-dimensional simultaneous presence within the whole universe limiting and defining itself in the highest velocity possible within it.

In the psychic sphere, space is not a condition of motion because the spatial extensification and motion here must coincide. Real original space must be considered not as the rest of death from which no motion can arise, but as the rest of life, within which spatial motions are produced by slowing down, not by a further intensification or activation. This rule applies to time also. The original universe is an abiding uniform duration. In place of its original simultaneous presence, we are confronted in the world-systems with a succession. Such succession can only arise by a slowing down of that maximum of velocity by which simultaneity is realised.

The more velocity can do, the less is left to be done by time which in the case of maximum velocity will be reduced to zero.

It is simultaneous extension, in which time as successive extension is swallowed up by or rather raised to simultaneity. This maximum of velocity means that the spatial or extensive differentiation is absorbed into a timeless but enduring unity.

We may look upon every motion as an attempt to overcome the contradiction between extension and simultaneity. In the case of separate motions in the Universe, this can only be done by means of succession of time. That is to say, the antagonism is only imperfectly overcome. Only in the case of original space-creating motion is the antagonism perfectly overcome and made a unity. Thus the velocity of the separate motions in the universe, can no longer be the original one unimpeded by any resistance but only a fraction of it, needing multiplication by time or succession to outweigh the preponderance of extension over simultaneity.

Thus space and time are realised in the universe together and undifferentiated space means unsuccessive time, changeless duration. The most prominent feature of this original space-creating motion is that it has no pre-existing extension or resistance to overcome. Distance and mass have no significance to it. It is a pure spiritual state. It has a power of constructive activity opening a vast field of freedom to all spatialising activities, which limit themselves to special areas and differentiate themselves by different rates of succession resulting from a slowing down of the original velocity. In this way, original velocity is tempered into cosmic rhythmic motions. Real space is a dynamic continuity or a totality which can only be understood if intellectual analysis is supplemented by intuitional synthesis. In order to reach this stage, there must be an understanding of the pure negativity and unreality of rational forms–a view which is perfectly constitent with their absoluteness in normative respect. The difference of the norm from the cause is just that the norm is a dynamic and indifferent to real and dynamic existance while the cause is dynamic. Dynamism involves an element of irrationality which cannot wholly be exhausted in rational formulas. Formal space of spiritual state is the very antithesis of motion in so far as it is perfectly stationary. In the differentiated universe, we have to do with a vast variety of velocities, which relatively and mutually cannot wholly be reduced to the other. The " now " of the conscious perception is different from and has wider extension than the "now" in which the moving sense object occupies a certain point in space. And the same discrepancy may be said in greater or less degree to isolate the different velocities of motion from each other. The spatial "now" is wider in the case of a slower than in the case of a quicker motion, because the slower moving object may be said to remain in the same point of space longer than the quicker object.

By motion, spatial existance is not only made dynamical but also as a consequence of this to some degree irrational. And if the simultaneous uniformity of original motion is differentiated too much i.e. dissolved into mutually clashing and disharmonious motions–a perfect chaos is the result, insusceptible of any rationalisation.

As an electron becomes a particle when some obstruction intervenes, the Absolute becomes individual when a man is bound by body-consciousness. Gold of 100 carets is so soft that no ornaments can be made out of it. There fore, some copper or silver has to be mixed with it in order to make ornaments. Similarly, an individual by some inertia or Tamas acquires some limitations in his spiritual state. There are many kinds of such limitations. He sees a different world when there is lust and a different world when there is anger in him. Different kinds of feelings create different kinds of fields. A poor man and a king are not living in the same world. Somebody asked a barber what he will do if he were made a king; he said he would shave with a golden razor. But he forgot that after becoming a king, the shaving business has to be entirely thrown off. A prisoner remains in jail and a police man who looks after the prisoner also remains in jail. The prisoner gets his food free of charge. The police man has to earn his food by doing his duty. The prisoner can take sound sleep but the police man cannot. The prisoner can get out of the jail earlier but the police man cannot, yet the prisoner considers himself more unhappy than the policeman. After the satyagraha movement in

India, the prisoners had begun to consider themselves more happy than the polic men who looked after them. All these are instances of different kinds of feelings. In motion we are confronted with a dynamic element of existance from the outside. In feeling and will it is experienced from the inside. In both cases, there is something in it which resists perfect rational objectivation and dissolves the rigidity of rational continuities formulated by the intellect alone.

The concept of something happening is always that of a four dimensional continuum but the recognition of this was obscured by the absolute character of the pre-relativity time. On giving up the hypothesis of the absolute character of time, particularly that of simultaneity, the four dimensionality of time-space concept was immediately recognised. Modern scientific knowledge and the highest Indian philosophy has brought us to a stage where there is not so much of a negation of existance as a transcendance of conception. When the observer is put in the possession of correct knowledge, the universe is found to be non-mechanical. Time, space, causation, duration, mass, force and motion are relative and have no absolute significance. They are not attributes of physical realities but are relations whose value changes with the observer's attitude to the object. The new theory has also proved that the world of three dimensions is an illusion. Individuality becomes a thing when certain specific modes of its action are recognised under the limitations of time and space to the exclusion of others. Therefore, if a man wants to deliver himself from the causal sequence of time, he must die to or in other words forget the temporal self and become united to the eternal which is beyond time and cause. Present science says that a natural gravitational field cannot be transferred where attracting matter exists. Knowledge is in the knower according to the mode of knowing. Where the knower is poly-psychic, the universe he knows by immediate experience will also appear to be poly–theistic. The deliverance from causal process can only be achieved as a consequence of the intervention of eternity in the temporal domain and eternity cannot intervene unless the individual will makes a creative act of self-denial, thus producing as it were a vacuum into which eternity can flow.

Men will continue to commit atrocities as long as they will continue to believe in absurdities. Therefore students should be taught what to think and how to think. Education for a full and whole life is more important than education for mere livelihood. If human beings are the materials on which education has to work, we must first find out what is a human being, what are his limitations and how these can be overcome. He is not a body and not a mind only. He has a soul which must be realised by true wisdom.

Maya veils the truth from us by presenting a world of plurality. The following are some of the results of the maya.:-

(1) Waking is considered as real but dream unreal although both are products of maya.

(2) Sleep is nothing, yet men say they cannot live without it.

(3) Feelings and sensations are individual but their objects are sought outside. In dream there is no outside.

(4) Man is born alone, dies alone but in the middle he cannot remain without society.

(5) Every one moves in a private world of his own, yet he believes in a common world.

(6) Dream world is not common, egos are false but the waking world is believed to be common and other minds are considered to be real.

(7) Men worship truth; though the world may not acknowledge it men seek testimony or harmony with others to discover or determine truth.

(8) Hope and memory delude, yet men cannot give up the one and dispense with the other.

(9) Life must end, yet men's behaviour presumes its eternity.

(10) Men believe in the good but evil stares them in the face.

(11) Men act as if they are free but they discover that they are bound.

(12) Men regard the world as true and yet they seek truth and reality beyond.

(13) Men are never happy yet they are for ever seeking happiness.

(14) Men discover error when it is past and yet they believe that they are correct in their views.

(15) A future life is but an imaginary extension of the present yet men stake their all in its defence.

(16) Many persons are selfish yet they expect others to be unselfish.

(17) Doctors die of diseases for which they have invented unfailing cures.

(18) Marriage is sought by the bachelor while the married man seeks divorce.

(19) Mediocracy obtains renown while talent and merit languish.

(20) A king governs a state and a parasite governs a king.

Many great empires have shrunk into a historical fiction. The unmistakable finger prints of maya shine on them all. But maya can be controlled by right culture. Status of actuality or potentiality of a perceived region depends not so much on the region itself as on the mode of percipients' reaction to it. It is neither the point in space nor the instant in time at which something happens that has reality but the event itself and these events are relative depending on the condition of the observer. In a relative world, there is only so much world as we are conscious, the rest does not exist. Its utility is paralleled to our consciousness of it. Time and space are not parts nature but our observation of nature. Therefore, a world without an observer cannot be taken into consideration.

A philosopher has the advantage that he has long reflected and brought to light certain principles of sound action. Most men live more by feeling than by thinking. Emotions reveal something about the character of man but nothing about the true nature of the idea or event itself. Feelings easily entangle the thinking faculty and prevent its clear operation. Feelings are liable to change; what is felt now as true may be discarded to-morrow as untrue.

The division between thought and being, idea and existance was long before perceived by the Hindu seers. They had come to the conclusion that so long as the given, the object, cannot be reduced to or incorporated wholly in the real observer, idealism cannot be maintained as a living faith.

The idea attains reality not as separate from the subject having the idea, neither as distinct from the object of which it is the idea, but it is transferred into the real through the resolving of the subject and the object into the oneness of an all-inclusive experience. Where the self as subject knows the not-self appearing as the object, it is an instance of one preceiving or knowing another. This otherness gradually thins away as the object approaches nearer and nearer the subject, appearing first as the external object, then as the idea related to the subject and next as ideas forming part of the subject itself. But it is only when the idea is completely merged into the subject or rather when the subject as the knower and the object as known resolve themselves into the non-relational consciousness that the otherness becomes completely extinct. Knowledge must, at the last step, be unconditional, depending upon no condition and no process must be external and must depend upon nothing else as its further criterion. To ask always and for ever for a criterion of knowledge and truth and not to reach the goal is to declare the impossibility of knowledge and the bankruptcy of the human reason.

The knowledge which is knowledge of an object depends upon the latter and also upon some factors conditioning the process. The validity of this knowledge depends upon the reality of an object and the veracity of the process and such testing of truth through another leads to infinite regress, अनवस्था दोष. Such conditional knowledge can never be eternal. Within the realm of division, we never find the Real but only an aspect of it. The Real is prior to this division into related and opposed complementaries, which division is all that is meant by creation. The Indian philosophy gives us an Absolute which does not enter into any temporal relation at all, not even as the support and originator of temporal series.

The ideal state of consummation has been variously described from different points of view as perfect peace, balance, harmony, absolute fearlessness, freedom, liberation etc. and the ignorant state (by contrast) is represented by such terms as disturbance, disharmony, discord, fearfulness, determinism, bondage etc. It is through practice and right thinking that we pass from disharmony to harmony, from multiplicity and variety to unity and oneness, and from a state of disturbance to a stage of perfect peace and the whole course of religious practice prescribed by different religious sects, although differing in forms and details is always an embodiment of means and methods of attaining the stage of harmony and peace which is identical with freedom and liberation. The amount of progress is measured by the extent to which animality is subordinated to or rather transformed into divinity. The higher self then gains an authority over the lower self and mental strength is increased. All the struggle presupposes an alien element to be overcome.

Actions done only in obedience to the impulses and desires of the moment and not grounded in the ultimate principle of consciousness lead us astray, and sever us from our fundamental essence and hence our bondage in the form of births and deaths, but actions done from the sense of duty, actions done with a view to worship the Lord of the Universe, actions done with a sense of equality do not create further desires and thus do not produce attachment and hence are helpful in gradually preparing man for liberation and do not become the source of bondage. Karma or action not only proceeds from the desires and is the realisation of desire, but it also helps to eradicate desires if performed in a disciplined and detached manner. In the scientific language, Karma is an event and event is not binding if its relativity is properly understood.

An individual and a nation cannot be placed in the same temporal scale. National and social problems evolve very slowly. Even in individual matters, one man's time-space is not similar to another man's. An old man's life is different in many respects to the life of his great-grand children. Some of the elderly men now living may have read our religious scriptures but the present young generation is greatly influenced by newspaper events, cinemas, automobiles, athletics and democratic ideas. The standardization of men by democratic ideal determines the predominance of the weak. Everywhere the weak are preferred to the strong. They are aided, protected and admired. Like the invalid, the criminal and the insane, they attract the sympathy of the public. As it is found impossible to raise the inferior type, the only means of producing democratic equality among men is to bring all to the lowest level. The social struggle has become harder because the mode of existance brought to us by technology appears to be as pleasant as the habit of taking alcohol, opium or cocaine. All are obliged to conform to the habits of the herd. It is chiefly through intellectual and moral discipline and rejection of the habits of the herd that an individual can reconstruct himself.

The only way to obviate the disastrous predominance of the weak is to develop the strong. Pilots are retired according to the physiological age and not according to the chronological age. A doctor for a hospital cannot be elected according to the majority of the votes of patients. The same rule applies to psychological development. By helping the intelligent, self-controlled and spiritual man, we can indirectly help the weak and the ignorant. The herd always profits by the ideas and life of a strong spiritual man. Criminality and ignorance can be prevented only by better knowledge of man, eugenics and by changes in education. The development of human personality should be the chief aim of civilisation.

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CHAPTER 10

What is the cause of all events?

There can be no event without an agent or an observer. An event does not persist or move like the traditional piece of matter. It merely exists for a little moment and then ceases. A piece of matter thus resolves into a series of events. A given observer will regard one member of the group of events as earlier than the other but another observer may judge the time order differently. All that we really have is a connection between two events which works equally backwards and forwards.

A cause requires time and space. Time and space do not exist in the Absolute nor in the world but in our relation with the world. The collapse of the notion of one all embracing time in which all the events throughout the Universe can be dated must in the long run affect our views as to cause and effect, evolution and many others. The uniformity of nature, the law of universal causation and so on are attempts to bolster up our belief that what has often happened before will happen again which is no better founded than the bullocks belief that the driver will take the turning he usually takes. We get a concept of Causation in those regions of experience where active efficiency is immediately given. When we search our experience for direct evidence of causal action, we find it in the relation of events which constitute our conscious life.

Spinoza accepts the following definition of freedom and necessity. " That thing is called free which exists from the necessity of its own nature alone and is determined to action by itself alone. This is called 'swasatta' स्व सत्ता in the Indian philosophy. That thing on the other hand is called necessary or rather compelled which by another is determined to existence and action in a fixed and prescribed manner. This is called पर सत्ता 'Par-satta' in the Indian philosophy. God is free because He is not determined by anything outside of Himself. In the case of man, we see a necessity defined in terms of external determination. Still a dilemma remains viz., if God is omnipotent, finite things are inefficacious and man has neither freedom nor moral responsibility. If finite things are efficacious and man is a free agent, God is not omnipotent. The body of man moves according to his will but what is the cause of the will of man? Again when the body is sick, it does not move according to the will of man.

There are two kinds of causes (1) the real cause and (2) the occasional cause. The real cause of the second world war was the growing tension between different countries regarding economic prosperity of one at the expense of another, but the occasional cause was the demand of Germany for the Danzig port. Our observational knowledge of the outer world is limited by the aperture of our senses and these form blinkers which prevent our seeing beyond space and time just as our telescope may prevent us seeing more than a small angle of the sky. The laws of nature tell us little or possibly nothing about nature but certainly something about ourselves. Suppose some one brings a daily newspaper in a crowd of men, they will all move to see what is happening in the outside world. The newspaper has an effect upon people and we might describe the newspaper's action upon them as of the nature of a force. The crowd moves about after reading some news therein. This movement has more concern with men's nature than with the news. Some may like the news and some may not like the news. A poet might say that water runs downhill because it is attracted to the sea, but a physicist or an ordinary mortal would say that it moves as it does because of the nature of the ground at that point without regard to what lies ahead of it. Just as the sea does not cause the water to run towards it, so the sun does not cause the planets to move round it.

The assertion of determinism implies the assertion of absolute knowledge. If we say, A determins B, we must have certain knowledge about A and B. If we say God has created the world, we must have certain knowledge about God and the world. Besides, if a man has a little freedom, God's absolute freedom will be in doubt.

In visual perception, we are rarely concerned with the act of perception, our interest instead lies in the object perceived. This object informs us of surrounding objects and enables us to adjust our movements. It is only in cases of error in our practical life that our attention is turned from the object perceived to the act of perception. Each sense has its perceptions limited by a certain threshold of sensation and if the stimulus of a physical effect falls below this the sense in question registers nothing at all. We cannot experience the sweetness of a single molecule of sugar, nor the smell of a single molecule of musk, neither can we hear a bell at more than a certain limit of distance, nor see a star which is below a certain limit of faintness. In the language of modern physics, we cannot experience a single photon; thousands are necessary to attain the threshold of sensation. Heisenburg's principle of uncertainty shows that so long as we can explore nature by complete photons, there is no hope of obtaining information which is perfectly exact with respect to both time and space. Exactness in time is obtained at the price of inexactness in position and vice-versa. The waves of light, provide a representation not of objective nature but only of our knowledge of nature. Modern science recognises the fact that there is a residue of irrational diversity which cannot be reduced to the identical and the rational. It admits the existence of irreversible changes in time. When an irreversible change takes place, there is not an underlying identity between the state before and the state after the change. Science is not only the effort to reduce the diversity to identity; it is also among other things, the study of the irrational brute fact of becoming. There are two tendencies in science; the tendency towards identification and generalisation and the tendency towards the exploration of brute reality. We shall never succeed in changing our age of iron into an age of gold until we give up our ambition to find a single cause for all our ills and admit the existence of many causes acting simultaneously, intricate correlations and reduplicated actions and reactions. This principle applies to statistical viewpoint where we have to consider many events together. From the individual point of view, all the events have one cause i. e. our defective knowledge. In dream there are many events and in that condition many causes appear for those events but the real cause of all events was only the false knowledge of the observer. Large scale manipulations of the social structure can bring about certain changes in human nature but these changes are hardly fundamental. They do not abolish evil, they merely deflect it in other channels. But if the ends we all desire are to be achieved, there must be more than a mere deflection of evil; there must be suppression at the source, i. e. in the individual will and this means that our educational system requires to be radically changed. The world which a poor man inhabits is not the same which a rich man inhabits and similarly, the world which a man of wrong culture inhabits is not the same which a man of right culture inhabits. False beliefs result in evil and true beliefs bear fruits that are good. False ideas result in wrong action. Modern science says that as the view of the physical world is perfected, it simultaneously recedes from the world of sense. Each individual system is now regarded as a whole, in which each individual particle, in a certain sense exists simultaneously in every part of the space occupied by the system. This simultaneous existence applies not merely to the field of force with which it is surrounded but also to its mass and its charge.

The content of an experience is proportionately richer as the measurement upon which it is based is more exact. Hence the advance of physical knowledge is closely bound up with the accuracy of instruments and with the technique of measurement. But measurement alone is not sufficient, for, each measurement is an individual event standing by itself; as such it is determined by special circumstances, especially by a definite place and a definite time, but also by a definite measuring instrument and by a definite observer. There are many cases where it is extremely difficult to find a common law governing a number of different measurements. When an observer does not interfere with events, causation and determinism will work, but in several cases observers are not passive spectators. Everyone likes to do something in the world. Therefore, determinism is very often up-set. Before the eyes of an apprehending observer, the will of another man whom he observes comes about as the result of the joint action of a number of motives or impulses which act within him with different forces and in different directions, which result within him in a certain event. It is not possible to recognise the causal conditions of several motives and properly to appreciate their significance. Any influence exerted on the train of the observed person's thoughts even if unintentional would disturb the causal principle, and would introduce error in the conclusions drawn. Even the fact that the object of the experiment is aware that he is under observation can become a source of error.

For instance, when a man is looking at a lady or when a lady is looking at a man, there may be several motives in the mind of the observer. It will never be possible to claim with certainty that the observed person's decision will remain uninfluenced by some new and immediately preceding information. At each new communication, the observed person is presented with a new fact and this fact causes him to revise his deliberations.

Let us now consider our own will-actions. To what extent, are we able to comprehend the causal determination of our own will ? Evidently the only possibility is to attempt a division of our ego into a percipient ego (SAKSHI) or a willing ego (PRAMATA), to the first of which we assign the part of the observer, while to the second we give that of the observed. In this case there is an important difference if the will action belongs to the past or if it belongs to the present. If the action has already taken place, the desired condition is fulfilled that the observer shall be passive; for in this case, the willing ego chronologically precedes and the percipient ego comes later, and there can be no causal interference by the observer in the event which he is investigating. The fact is that all our past actions, like all other past events, lie perfect and finished before our inner eye and we are in a position to regard them as unchangeable events. But the case is altered when our actions lie in the future, for then the observer ceases to be passive. The observed and the observer, the willing and the percipient ego are merged in our consciousness, and it is impossible for the observer to avoid any causal interference with the observed. When we consciously make a decision, the one ego merges with the other. Each new observation gives rise to a new motive and the recognition of this motive in turn creates a new situation. As in dream, so in the waking condition. Therefore, a complete understanding of a man's future remains unattainable. In the lives of many persons, the will is sovereign in the final decision and it decides without consulting the understanding. But in the case of men of wisdom, the understanding or consciousness is very often consulted and their will is free to decide.

In physics, any quantitative prediction about a spatial-temporal event has definite meaning only if the system of reference is indicated for which it is supposed to be valid. This system can be selected at pleasure, and in accordance with different systems chosen, the prediction too will differ. If a system of reference closely connected with the earth is taken, we must say that the sun moves through the heavens, but if the system of reference is transferred to the sun, the sun is at rest. There is an opposition between these two formulations but there is neither contradiction nor obscurity. We are simply dealing with two different ways of looking at the matter. The two systems of reference and the corresponding points of view are equally correct and equally justified and it is in principle impossible to employ any measurements and calculations in order to choose between them, except in an arbitrary manner. The controversy about the freedom of will thus is revealed as a controversy about the point of view. Neither science nor self-knowledge can give us full light on our future actions in any given situation; a different guide is needed for this end, a guide acting not on the understanding but immediately on the will by providing us rules of conduct for given situations. But this is not possible for all occasions. A satisfactory formulation of ethics is the chief and the hardest problem of human spirit, because there are many occasions in human life when a man is confronted with conflicting duties, for instance, when a man marries, he has a duty towards his wife in addition to his duty towards his mother. If his wife and his mother are not on good terms and get into quarrels very often, what is the duty of the man? The mother has taken great pains in rearing him up from childhood. The wife has left her parents depending upon the good will of her husband. We can say that his motive in life will decide his course of action. Many ethical systems have been worked out in the course of centuries, and between these there has often been acute conflict. It is easier to distinguish between true and false than between valuable and valueless. By purifying the understanding, a man can become free if he likes. It is of no use to indulge in over-anxious consideration of past events. The settled conditions of the world are those general characters exhibited by the systematic inter-connection of the entities which constitute the world. The immense number of these events as contrasted with the free activity of any individual event makes such free activity practically unimportant so far as the general order of nature is concerned but the recognition by the modern scientists that order is statistical and not imposed by God illustrates the fact that this free activity cannot be entirely disregarded The closer science comes to the consideration of the behaviour of individual events, the further it departs from statements of uniformity. Acts of perception, or will or desire are individual events. They exhibit the influence of the past. But when we consider them directly, we are sensible not so much as the grand uniformities of nature but of the free activity of each individual event.

This means that so long as a man remains in the society and wants social happiness, he will have to undergo social restrictions. In that case, determinism will show its strength, but in the case of an individual who does not want social happiness, but wants spiritual happiness, the society especially in India has allowed him sufficient freedom. Those men who can control their senses and do not want sensual happiness are treated in India with great respect. The determinism comes with a kind of social measure. The present Governments of different countries give convenience for material happiness but fail to lead society forward to spiritual happiness. That is left as the duty of the Church. In order to improve his nature, a man should either change his mind or should change his circumstances, otherwise he will remain under the thumb of determinism. Therefore, two kinds of education are necessary, (1) to turn immoral humanity towards morality and (2) to turn ignorance of the spirit into knowledge of the spirit. When the government and the social structure are such that every man can improve himself, many laws are not necessary. Government cannot be carried on according to one man's will but if the man in power is wise or keeps a council of wise persons to advise him, there are less chances of error.

The relation of cause and effect is not something that we find in nature but is rather a characteristic of the way in which we regard nature.

When somebody is accused of having committed a murder, the pleader of the accused sometimes tries to prove that the accused was not present at the time and at the place where the murder took place. If this is proved, the accused is set free. Similarly, the actions of the practical life are mostly done by the willing ego. If a man often considers himself as connected with the percipient ego and not with the willing ego, he can get himself free from the results of the work of the willing ego. This is something like putting the observer in another place. This is equal to waking from a dream. In the differential equations of the quantum theory also, the boundary conditions are not the objective facts but the knowledge we happen to possess about them.

As length and duration are not external to the observer according to modern physics, succession is not also external to the observer. There is no world existing independently of an act of perception. If we eliminate the observer or the act of experience, we eliminate likewise the length, and duration and the relation of succession. The theory of Relativity informs us that there is a residue of variability in measures which cannot be eliminated because in fact the relations we try to measure are partially non-existent i.e. they change as soon as the system of reference is changed. They are relations involving more terms than we thought they did. Considered by itself, the relation of succession does not exist. What exists is the perception of succession. Changes in visual phenomena are not intrinsic changes of the objects of the external world. The perceptual extension does not involve the assertion of existance of extended substance but rather that extension is a relation within a percipient event. Externality can not be understood in spatial terms, since the essence of extension or space does not lie in the fact that it divides entities, but in the fact that it is the mode of togetherness of objects within an act of perception.

All the ideas of distance are ideas of relations and may be said to imply the existance of something which perceives those relations. If the distance and place are inconceivable in the absence of the mind of which they are the ideas, the independent existance of figure which is the limitation of distance and of motion which is change of place must be equally inconceivable. This principle applies also to time and to causation which depends on time. In other words, time and causation are also relations and have no significance in the absence of an observer.

When for the logical relation of necessity we substitute the chronological relation of the succession of antecedent and consequent, we can do so only because we have no consciousness of the unity which is all the while present in the simple relation of time which is a subjective elaboration of the presupposed sensible material. Should we become conscious of the subjective unity in the true relation, the causal chain in the pure multiplicity would be broken and empiricism would lose every criterion and every means of making the real intelligible. When the object is cut off from the subject, we are meaning something which is meaningless.

When the mind is historical, it is changed into a natural entity. When its spiritual value only is kept in view, it is withdrawn from the history and stands before us in its eternal ideality.

Spirituality consists precisely in the actuality of the multiplicity as unity and as unity alone. As the rolled up cloth and the unrolled cloth are not different, so cause and effect are not different. When cause and effect are identified change and causation become only appearances.

Supposing, a bachelor gets a dream. He marries a girl in that state. He gets children and in the same dream, he gets children's children. From the knowledge of the waking state, we learn that so much time did not really exist but was created by his mind in that state for his specific purpose. Besides, although in the dream state he was the cause of his children and his children were the cause of his grand-children, yet when he woke up, he found that he was not only the cause of his children but also the direct cause of his grand-children. The cause-effect relation that was found to be true in the dream state between his children and his grand children was entirely destroyed when he entered the waking state. The dream father and the dream-son appear together and yet in the dream the father is considered to be older than the son.

The dream as a dream does not permit a man to doubt its reality. Even so a man is unable to doubt the reality of the world of the wakeful experience while he is in that state. How can a measure which has itself created the world accept it as unreal? that is the significance of the M. M. experiment which led to the discovery of the theory of Relativity. The value of Einstein's work in proving the truth of relativity by physical facts instead of by metaphysical conceptions is immense, The entire principle of relativity raises a gigantic question mark against all our experiences of the universe and all our definitions of knowledge. To understand it properly requires hard thinking. Just as food cannot be digested without being masticated, so ideas cannot be assimilated without having been thought over and understood.

Several physicists consider that the theory of relativity cannot be applied to psychology or to philosophy. This attitude is not correct. If they can find a difference in what they think is their rational self and what is their spiritual self, it is easy to apply that theory to psychology and to philosophy. It is the philosophers of science rather than the laboratory workers who should point out how this can be done. It is imperative for an intelligent man to know something of modern science and philosophic thought. The calculus of errors forms an important part in science as well as in philosophy. The edge of a razor blade is a continuous straight line but if we examine it under a microscope, it resembles wavy line drawn by a child. Common sense tells us that a piece of steel is solid. X-Ray shows us that it is porous. If our reasoning at the starting point is false, our conclusion will also be false. Sometimes we find that an event has one cause, after careful thinking we find that it has many causes. Sometimes, we find that an event has many causes as in dream. On waking we find that it had only one cause viz., ignorance of the self. Therefore, our experience is not a hard fact but a harder problem. It is the scale of observation which creates the phenomena. Everytime that we change the scale of observation we encounter new phenomena. On the chemical scale, we have atoms of iron and carbon. On the sub-atomic scale, we have electrons in perpetual motion which travel at the rate of several thousand miles per second. There are many scales of observation. In the Taitariya Upanishad, five scales have been given. viz.. the physical, vital, mental, supramental and the spiritual. We should not confuse the human laws which our intelligence has superposed on facts with the true eternal laws which escape the understanding of ordinary man. Man plays the part of a radio receiving instrument and transforms the properties of objects into properties which are perceptible on our scale of observation, either directly or indirectly by means of brain and mind. A simple change in scale of observation gives birth to two different phenomena with respect to the observer. For a microbe one day of twenty-four hours may correspond to a century. We should, therefore, admit the existence of an evolution of evolutions covering periods of time quite inconceivable to man. This is explained in the next chapter by some examples selected from the Yoga Vasistha.

The principal preoccupation of man until now has been the domination of his universe. But if real progress is to be made, he will have to dominate himself. To accomplish this, he will have to conquer not only his lower instincts but the habits created by the rapid progress of the mechanical arts. Man insensibly becomes the slave of these habits and often considers them as a goal. But if our rational instruction could be combined in schools with a broad religious instruction, surprising results can be observed. We are generally dominated by the events in which we take part. Their proximity, the fact that we are actors in the drama, warps our perspective, prevents our embracing the phenomena as a whole and attributing to each event its relative value. The information furnished by our senses is imperfect, relative, and only covers an infinitely small portion of our real universe.

When we examine a process in evolution, which created present human beings, we should not take the rapidity or slowness of the events into consideration. What is "rapid" to us in relation to rhythm of life, of our sensorial and intellectual mechanisms, conditioned by the structure of our brains, will be slow for an insect with a life span of only a few days. To an imaginary being with a life span of about ten thousand million years (like the day of Brahma) our evolution would seem to be very rapid. To God it may be instantaneous. In human life also, time does not have the same value in childhood as in later years.

Education is the weapon of progress. Therefore, histories will have to be re-written. Nothing is easier than to exact racial or national pride. Therefore, future histories should consist of the lives of moral and spiritual men. Time contracts for man, its value is no longer on the scale of statistical evolution depending on chance but on the personal scale. Socialistic ethics result in political or party groups which are artificial and bring out many restricitions to freedom.

To know an object from a particular standpoint is not to know it thoroughly. This is relative knowledge and not absolute. The non-relational state of appreciation is known by the term intuition in philosophy. Intuition gives us knowledge of the whole and involves a simultaneous and synthetic presentation of the eternal order of things as distinct from the successive and analytical presentation of the intellect. When the finite will can identify itself with the world-will, it can have an appreciative knowledge of the universe where the catagories of spacetime and causality etc., are hopelessly inadequate and useless. The Vedantic liberation is not so much a negation of existence as a transcendance of conception. This does not mean that the world is transmuted or transformed in order to form an element in the life of the Absolute, it is seen from a different view-point.

The realisation of the Absolute is the goal of all religions. This realisation can be had in two different ways. (1) by emphasising the object factor in consciousness. and (2) by emphasising the subject factor in consciousness. The path of devotion takes . the first method, the path of knowledge takes the second method. In the first method the principal means is the surrender of the ego, in the second, non–recognition of the ego. In both cases, the attitude of the observer changes. Every enhancement of the separate personal self produces a corresponding diminution of that self's awareness of divine Reality. Any violent reaction of the surface ego against distraction automatically enhances the separate personal self and therefore reduces the individual's chances of coming to the knowledge and love of God. If we have achieved a certain degree of alert passivity in relation to Reality and if distractions intervene we should shift the focus of attention to Reality which we can glimpse. This effortless shift of attention will change the condition of the observer and will cause the distractions to lose their strength and ultimately to disappear. True value of a human being is determined primarily by the measure and the sense in which he has attained to liberation from the ego. The ego is the atom of the psychic world. If the disintegration of the physical atom has given the energy of the atom bomb, what may not be accomplished by the annihilation of the ego ?

Once a man is set to the pursuit of external things he is never satisfied with the mere necessities of life, but always strives after more and more. He forgets that inwardly he remains the same. Unless there is a descent of a new consciousness. not subject to the dualities, the kingdom of God on earth can only be an ideal. There is such a thing as psychic gravitation by which souls find their own level, i. e., their environment. Therefore man should learn to regard space and time not as objective realities to which everything must confirm but as concepts which must be transcended. They are not the objective realities independent of consciousness. In the consciousness of a drowning man, events of a life time take place. It is the spatialisation of the mental activity which creates sense of multiplicity and it is the temporising activity of the mind which creates sense of time. This is beautifully illustrated by some examples in the Yoga Vasistha. These examples are given in greater detail in the next chapter.

Scientific philosophy today is gradually drawing nearer and nearer to religion. It is an approach of hesitant advances and retreats, yet many real links have been made. The knowledge and experiences of men will be enormously enriched when the factual evidence of science is whole–heartedly at the service of philosophy and religion.

Einstein said at one place in 1945 that "it is an illusion to think that we perceive the world."

When we say that we perceive the world, we have already transformed our sensations–by a primitive theory–into something conceptual. What our senses give us can only become a conception of the world through a conceptual construction.

Each man's rainbow is a selection of his own vision, a subjective selection from an objective appearance of reality, which is not a rainbow at all. It is the same with nature which every one sees. Therefore, our instrument of measurement, i. e., our knowledge about the world must be put in the right position. A proposition has no content unless a measurement process is specified by which conservation can be tested.

Several men are putting the question "what is the cause of the universe ?" Let us consider the age of the universe. Acording to the science of relativity, each observer's clock is at himself and records only epochs of events at himself. Therefore, the age of the universe has no objective content. Given an event, we have to mention an observer in whose now it occurs and the ages are different acccording to the observers chosen. There is no sense in which it can be said that the universe is running down independently of an observer. The world system though decaying and dying at each separate place and for each separate observer always comprises other observers for whom this process of decay has hardly gone on at all. It is not a question of cycles of rejuvenation or of a process of revivification. The fresh start is always psesent but it is really not a fresh start. It is the one start that every portion has but differently reckoned.

There is no re-enactment of creation. Creation is an event, you can say is or was at your choice. There is no difference in the two propositions until an observer is mentioned. In any world-wide present for whom creation was so many years ago, we can always specify events, the observers at which reckon creation as arbitrarily close to "is." One cannot select one particular system of graduation of his clock sub-divisions and call it uniform time. So far, uniform time is not definable. Different individuals assign different epochs and different distances to the same event. Therefore creation never recedes in the past. Creation is ever present in the universe, not a new idea but one to which we are led by the strictest interpretation of modern physics and astronomy. No absolute meaning would attach to saying that a million million years have elapsed since creation. No unique meaning can be attached to the phrase "The age of the universe at a given instant." There is no preferential frame of reference. Creation is ever present on the confines of the observable universe. The differing possibilities are different descriptions of the same reality, owing to different scales of time. The element of experience incorporated into the analysis is the observer's consciousness of the passage of time. i. e. his awareness of a before and after relation between any pair of events he experiences. Starting from this awareness and an initial arbitrary graduation of temporal experience, it proves possible to isolate that measure of time of graduation of temporal experience in which a free particle, projected among a "homogenious" set of equivalent time-keepers conserves its velocity. In this measure of time, the system appears stationary, non-expanding and of infinite extent. If we regraduate all the individual observer's clocks in a suitable fashion and alter all derived measures like lengths in the way implied by this regraduation, the law of motion transforms itself into the law of constancy of velocity.

All my recollections occur now, not at times when the recollected events occurred. In the dream, remembering has a quality differing from that of dream perception and in virtue of this quality, the remembering is referred to the past. But the quatity is not that of genuine pastness which belongs to the events of history, it is that of a subjective pastness in virtue of which the present remembering is judged (falsely) to refer to something that is objectively past. But objective past has meaning. As in the dream, so in the waking state. This will be made more clear by means of examples selected from the Yoga Vasistha and given in the following chapter.

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CHAPTER 11.

Wonders of the time-space

In this chapter, some stories about the relativity of time are given from the Yoga-Vasishtha, a famous Indian philoshiphical work. The following story is given in canto 44 in the Upasana Chapter in the Yoga-Vasishtha. It gives a clear idea of the wonderful way in wich time is experienced.

A Brahmin named Gadhi lived in a country called Koshala. He was very intelligent and well-versed in the Vedas. He renounced the world at a very early age and went to a forest for penance and meditation. He decided to carry on his austerities till he could see Lord Vishnu in person. After eight months' penance, Lord Vishnu appeared before him and asked him to choose a boon. Gadhi said that he wanted to see the bewildering Maya that the Almighty Lord had created. Vishnu promised that he would see it and then forget it. Then Vishnu disappeared.

Once when the Gadhi Brahman was having a dip in a lake, he forgot his mantras of meditation and lost his senses. At that time he saw in the water his own house There he became old and eventually died. He saw his relatives weeping and his wife bemoaning his death near his corpse. His relatives carried the dead body to the burning ground and there burnt it to ashes.

Gadhi then found himself being born in another country in a low caste (chandala) family. There, gradually he became young and then married a chandala girl. In his family life, he got some children. Then he became old. At that time all the members of his family died. Thus he became unhappy and wandered in a forest. (All these events were seen by him in a moment's dip in the water). Then he came to the capital of a Kir country. As the King of that country had expired, the people were in search of a new King. According to the custom prevailing there, the Royal elephant selected this old man as the King. Then he was taken in a procession to the place where the palace ladies welcomed him and decorated him with a kingly dress. Then the officers of the state celebrated his coronation ceremony. Thereafter he came to be known as King Gawala. He ruled that country for eight years.

Once having put off his royal dress, as he went out in the outer compound, he happened to see several chandalas there. All of them had black faces and robust bodies. An aged leader among them recognised King Gawala as one of their near relatives, addressed him as Katanja and said that he was very happy to see him. The king did not like these words of affection. The queens and ministers who were sitting in a balcony nearby happened to hear this talk and were much grieved to learn that their King was a chandala (out-caste.) The King dismissed the chandal-leader with contempt, but the people of the whole town came to know about this event. Then nobody liked to touch the King. The servants also stood at a distance for fear of pollution. The town people did not pay him any respect and he was shunned by each and everybody. In India, in the former times, men of low culture and low breed were not allowed to mix with men of higher culture and of high breed, the object being to preserve the best human seeds for better culture. At present, good bulls and good stallions are preserved and well-looked after in all countries for improving the breed of the cattle and horses; but no attempt is made to secure a good breed for human beings. In attempting to establish equality among men, the present society has suppressed individual peculiarities of high culture which are most useful. All ill-assorted types are herded together. If society is to be improved, we must help the strong and cultural class. The herd always profits by the ideas and inventions of the cultured class. It is chiefly through intellectual discipline and rejection of the habits of the herd that the society can reconstruct itself. The struggle has become harder because the mode of existence brought to us by technology has become as pleasant as the habit of taking alcohol, opium or cocaine. The standardization of men by the democratic ideal has already determined the predominance of the weak. Everywhere the weak are preferred to the strong. They are aided and protected, often admired. They attract the sympathy of the public. As it is becoming impossible to raise the inferior types, democratic equality forces all to come to the lowest level. In this way cultural personality vanishes. The former caste system in India was meant to give more protection and more respect to the cultural class and this resulted in best human seeds. These cultured people of the ancient India have left for us some of the best spiritual literature, which the herd could never have produced. That time the cultured classes were not touching those who were weak, uncultured and sensual.

All the people of the Kir country then decided as a way of purification to burn themselves to death. Accordingly many funeral pyres were ignited and all the people including women, children and ministers jumped therein.

The chandlal King Gawal thought that he was the cause of the evil circumstances in which the country was placed. Therefore, he also plunged himself in the fire. At that time the Gadhi Brahmin in his dip in water began to feel conscious that he was Gadhi who had come to the lake for a bath, that he had to recite his mantras and that he had not to rule over a country. He came out of water and began to ponder over the experience he had in a moment's dip in the water.

After some time, a guest came to his Ashram (residential place) and told him that a chandala king ruled the Kir country for eight years and his name was Gawal. Gadhi went to that place and saw with his eyes everything in detail what he had experienced in a moment's dip in the lake. He also saw the village where he had passed his young days of the chandal life. Besides, all the people living there gave him the same information. His curiosity further increased. He actually saw there before his eyes all the objects in the material form that he had seen in a dream-like state when he took his bath in the lake. He suspected that this must be some kind of Maya, which by his own asking the Lord Vishnu exhibited to him.

Every man is born from a drop of water i. e of the male semen. In that water every man has had a dip. In that dip every one is getting experiences of several years. But if any one gets a spiritual experience he is a spirit, the effect of dip in that water is removed. That effect is also removed at the time of death but if anyone is reborn as man, he will again see the human world according to his measure of observation.

Gadhi again practised penance to please the Lord Vishnu and to understand his Maya. After some time, Vishnu came to Gadhi's cave and asked him what he now wanted. Gadhi said: "how did it happen that I actually saw with my own eyes the same chimera that I saw when I had my dip in water, also please tell me how I became chandala and then a king and got experiences of about 70 years in a moment's dip in water? Lord Vishnu said "This is only due to a condition of mind of those who do not know the real nature of their soul and who fall a prey to different diseases in the form of various desires which result in various kinds of observations. Everything is a creation of the mind. As in dream, so in the waking condition. There is nothing inside or outside nor short nor long duration. It is only the mind that muses over the objects of the present, remembers the past and creates the future in the same way. There is nothing to wonder that your mind created your chandala stage and had many wordly experiences. All these were nothing but a feat of your fancy. A mind which is crowded with hopes and fears. sees many unusual events in a dream and also in the waking state. People marry in a dream and get children also. You have moved in all directions through delusion. Now try to secure a high culture according to your Brahmin caste and stage of life. Having said this, Vishnu disappeared.

Now Gadhi again wondered that if all he saw was a dream, it should not appear again.

The same world appears always because it is not a dream. So once more he began to move in the Kir country and learnt the same facts again from the people living there. Then he practised penance and called Lord Vishnu. Gadhi said to him "I once more moved in that country and did not find any change in the talks of the people. How can I therefore believe that all that was a dream-like illusion?" Vishnu said "just as the impression of your being chandala was reflected in your mind, all the people who saw you had the same kind of reflection in their minds, and hence they corroborated your account. The false impressions can only be removed by true knowledge i. e. by right thinking. Several people get dreams of a common nature. Time is also a kind of relation imagined by the mind and that relation persists in several activities. The seasons and months are firmly fixed in human imagination, which is following the motion of the sun. These changes would not be experienced if a man is not moving with the earth. The real soul is not affected thereby. The world it self is nothing but an illusion. From the human point of view, there did live a Chandala named Katanja some years ago, and then became king Gawal in the Kir-country. He was of the same nature as you happened to see. When you had a plunge in water, the false impression in the form of that illusion was created in your mind by my thought.

Just as mind at times forgets events observed and experienced at a particular time, so it perceives through illusion, events never observed anywhere. Just as a good Yogi sees events of past and future, so you saw also through illusion the life story of Katanja who became king Gawal. This temporary illusion of yours is nothing before the life-long illusive impressions that people entertain in considering as their own, their wives children, home, relatives etc., which are not connected with them in any sense of the term. But one who has real knowledge of the true soul is never thus duped. He does not accept any otherness as true. You are not yet in tune with the Infinite. Your mind is still in the illusion of time."

Thus saying, Lord Vishnu disappeared. Gadhi then practised austerities for some years and controlled the erroneous habits of the mind. Then he became liberated, and obtained the eternal blissful state.

Liberation really means liberation from a false time-sense. Time, space, causation etc, which generally accompany the objective experiences both in the waking and the dream world are no more than ideas which vary with individual observers. The only events which an observer actually experiences are events at himself. Different individuals assign different epochs and different distances to the same event, yet the relation between the epochs they assign will be definite for two or more observers who stand in the same relation to the rest of the universe.

In a dream, a moment looks like years and on being awake, those years are changed to a moment. In the dip of water, in a moment, the Gadhi Brahman experienced events of about 70 years and on coming out of the dip, those years were changed into a moment. King Harischandra experienced a span of twelve years in a dream. The life of man is merely Brahma's moment. The span of the whole life of Vishnu is only a day for Shanker and those who reach the Absolute stage feel neither day nor night. Frogs are born every year at the time of the rainy season and many of them die soon. They have 50 births in a man's one life of 50 years. At the time of some calamity, even one hour hangs heavily on a man while during a happy period, even five hours slip away in no time. Every man experiences the time–sequence according to the nature of his observations. If a man is drowned and if he has been saved, on coming to his sense he reports that he saw before him events of his whole life as if they passed on a film-screen. If some one whom one loves is very sick or if he dies, he gets numerous thoughts in a moment. A patient under chloroform on coming to the conscious stage reports that he had many experiences in that short period.

Whatever happens happens as something observed by a particular standard of observation. At the time of observation, that measure appears to be true but all the events vanish in sleep, in concentration and at the time of salvation. What I did 15 years ago I did simply by the false conception of indentifying myself with the physical body; this is nothing but a delusion. It is similarly a freak of fancy that I will do a certain thing five years hence. We thus create a false environment of time-space etc.

2. Story of Lila as described in the Yoga-Vasistha

This story begins from the 16th Canto in Chapter 3 on "Creation" in the Yoga Vasistha. The strange-movement of time is wonderfully described at great length therein. Here it is beriefly described.

There was a king by name Padma. Lila was his queen. They were both devoted to each other. Once queen Lila while enjoying worldly pleasures thought of finding out some means by which her husband, the king Padma, might be immune from old age and death so that she might enjoy his company for a considerably long time. She thought of making an effort by penance meditation, self-control and observance of rules of conduct so that her husband may not die. She began to worship the Goddess Saraswati. After a year, the Goddess appeared before Lila and said that she was pleased with her devotion and that she might choose a boon. Lila in reply said that she required two things viz. that her husband's spirit should not leave the inner hall of the harem even after his death and that the Goddess should appear before her whenever called. The Goddess agreed to her request and disappeared. Lila then began to enjoy her choicest worldly pleasures. Later on when the time of the king Padma's death approached, he died being wounded in a battle. Lila was very much grieved to see the king's dead body. The Goddess then came to her help and asked her to preserve the dead body under a heap of flowers promising that she would get her husband back in a few days. She also added that the flowers will not wither and the dead body also will not decompose and his spirit will not go out of the hall. Lila did what she was told to do. Lila wanted to know where her husband was at that time and what he was doing. She also requested the Goddess to take her to him saying that she could not live alone without his company. The Goddess thereupon replied, there are three forms of space viz:

1. Chitakash or space full of desires;
2. Chidakash or spiritual space.
3. Physical space.

Your husband is at present in a place which lies in the zone of the spiritual region. By concentration that region can be seen and experienced here. So, you should leave aside all thoughts and try to occupy that region. The spirit being omnipresent, you will surely hit upon the spot where your husband's spirit is present now. Having said so, the Goddess went to her abode. Lila then fell in a trance and by mental concentration left the physical body. She then passed to the other region where her dead husband (king Padma) was ruling as King Vidurath. She got back from the trance and began to wonder as to which creation was true. Then the Goddess appeared before her. Lila said "this mirror in the form of creation is indescribable. Its name is the supreme spirit, and the creation exists inside as well as out-side just as in a mirror; so kindly tell me which world is true and which is false. The Goddess said, "the new creation cannot exist without any cause, the old creation must be the cause thereof. But if the old creation is a certainty it cannot create a false-creation. An effect cannot differ from a cause regarding time and space.

Lila:—Sometimes an effect seems to be quite different from its cause. Clay cannot hold water though (its effect) a pot can.

Goddess:—An effect which has been produced by a variety of instrumental causes, may look different due to instrumental causes but just like a lamp lighted from another lamp, an effect which has got one and the same instrumental and material cause does not differ from its cause. The old creation that produced the new is the material as well as the instrumental cause of the new creation and therefore they must not differ. Therefore both the old and the new creations are false. The new creation has been found there only by the impressions of the old. There are no other instrumental causes. It is the experience of all wise men that in effects of this nature the material and the instrumental causes are not different.

Lila:—It seems that my impressions of my husband have been intensified and proved to be the instrumental cause of the creation of the new world relating to him.

Goddess:—Just as that impression is based on imagination and just as the new creation is only an imagination, so the old one is also nothing but a freak of imagination as it has also been produced by the impressions of a still older one.

Lila:—That must be so.

Goddess:—Now your conviction is correct. Just as the new creation of your husband though unreal looked beautiful by the adjoining environments, so also this creation though false looks beautiful by external environments. In the sphere of self, there is a space in the form of worldly existence covered by etherial fluid. It contains seas, rivers, tanks, other regions, earth, and heavens. It is occupied by Brahma, the creator. In a corner of that space, there is a village where a priest Vasistha lived. He had a wife Arundhati. Once this Vasistha was sitting on the peak of a mountain in the neighbourhood. Then he saw a king passing. The king was going on a hunt. Vasistha then thought that a king's life was more happy and he desired to be a king in the next birth. He grew old cherishing that desire. His wife also felt the effects of old age. Like you, she also worshipped me and took a promise from me that her husband's spirit might not part from the body and might remain in the hall where he died. In course of time, that Brahman Vasistha died and stayed in the etherial space of the same house. Due to the deep ardent mental desire in the previous body, that Brahman took the form of the King Padma who is now your husband. The body of the same Brahman having turned in a corpse, his spirit has remained in the hall of that house in a mental region there. To day is the eighth day after his death and his spirit is there, yet. The same Brahman now appears as your husband-King Padma, and you are Arundhati, the wife of that Brahman Vasistha. I have narrated the main events of your past birth. Everything was manifest in space due to the illusion in the form of the life-period i. e. this present illusion in the form of the life has been reflected in the previous illusory creation. Although this creation is false yet appears to be true by virtue of the Divine substance, or the motion of the observer on which it is based. Therefore it is difficult to say which creation is false and which is true. There is no real form of creation except false knowledge, which is the root cause of all mischief.

This reply of the Goddess agrees very well with the present science of Relativity. Prof. Milne writes in his Kinematic relativity (page 3) that " the contents of the universe will have a different description according to the frame of reference used. The description of the universe by an observer at the centre of our own galaxy would be different for example, from its description by an observer at the same place but moving with, say, one-third the speed of light. If so, we may expect that the descriptions of the laws of nature by two such observers would be different. They would be reconcilable, of course, but different. There is no natural uniform scale of time because we cannot say what we mean by the word uniform in relation to time; we cannot catch the fleeting minute and put it along side a later minute". He also says at another place that we get a new fact when we change the observer. Space is also at the disposal of the observer. Physical space has no meaning. Space changes according to the rules adopted for the conversion of the observed data into co-ordinates. A manifold (even when it is called space-time) is not the actual world but a mental concept. The co-incidences of events which are called measures in the present science are always made at the observer himself.

Having heard the above account from the Goddess, Lila was wonder-struck for a long while and then said "How can you say so? Where is the spirit of that Brahman and where are we now? How can there be any similarity between that couple and us?"

Goddess:—The spirit of that Brahmin in that village is in the form of the soul and sees this big country in his mental region, just as the impressions of the wakeful condition are dissolved and assume a new form during dream; similarly your former impressions have vanished and have assumed another aspect.

Lila:—Mother, you told me that the Brahmin died only eight days back, while as a matter of fact, several years have passed since we were born. How is it possible that we have sprung up from that Brahman and his wife?

Goddess:—In the spiritual region, just as there is no definite length of space, so there is no definite length of time also. The whole universe with its moment, as well as an age appears to be so to one who has an illusion of birth based on the false knowledge of one ego as being "I" and another ego as "you". Now listen attentively to what I tell you how illusion is formed. A person in the form of spirit experiencing a senseless condition during death forgets all the impressions of life and perceives other impressions. As soon as he experiences the later perceptions, he in his spiritual region experiences that he is being supported by a physical body and senses and perceives that he has a body with hands and feet. As soon as he perceives the new body, he thinks that he is aged so many years, he has got some nice brothers and has a beautiful house to live in. He perceives all these things but that is due to the false belief of the identification of the soul and mind which have taken the form of body. The same spirit appears to be of another form in dream, of still another in other world and yet another in this world. Just as waves are not different from the ocean, so dream, next world, and this world are not separate from the spirit. Hence the world is neither created nor would it ever perish. As a world it has no existence by itself. What appears as the world is only an aspect of the spirit. The soul which has a particular form of life, though it cannot be really born believes that it is born and therefore perceives space, time, actions, objects, mind, reason, and other senses and feels in a moment that an age long time has passed.

Modern science also says that the apparent differences arise from the different possible ways in which the 'clocks' used by the particle-members of the equivalence, may be graduated. Until we know which scale of time is being used, in any given context, it is impossible to give an unambiguous meaning to any assertion involving time.

The Goddess further explained to Lila that king Harishchandra felt in a dream that some twelve years passed away. A man who has lost his dear wife seems to be feeling a day as long as a year. A false impression of distance comes where there is no distance and of age where there is no age. As in dream so in the waking condition. As long as the false idea of a serpent in a rope is not absolutely got rid of and our knowledge remains as knowledge of a serpent, so the whole creation is falsely believed to be existing in Brahma and is not lost sight of till its absolute non-existence is realized.

Lila: As I am not used to think in this manner, I am not able to comprehend your statements fully; so please take me to that creation viz. the village in which Vasistha lived.

Goddess: Concentrate yourself, forget present observations and be pure self. The physical consciousness of the body of yours is a great impediment in seeing that creation. Forget this physical body and assume your causal body, and then you will be able to see your former worldly existence. One can reach a thought-created city only by similar thought.

Lila-What happens to the physical body when the consciousness of its mental state deepens ? Does that physical body become mental or does it perish altogether ?

Goddess: The possibility of perishing or not perishing can be found only in existing things. How can a thing which has no existence perish ? When a piece of string is consciously recognised as such how can you see a serpent's existence which was imagined therein ? Would you consider the serpent to have perished or not perished. Just as by true knowledge, the serpent is not apprehended in a rope, so a body when consciously known to be a product of mind, loses its state of being a physical one; the physical body is a mere appearance.

Lila:—How is it possible that the spirit which is the only existing element, devoid of any time-space division can come with first imagination ?

Goddess:—Just as gold does not possess any knowledge of its being a bracelet or water, a wave, or dream, an imaginary city, so as a matter of fact, the Absolute Brahman cannot have any such imagination. It is perfectly pure and does not have any imagination. The Absolute is devoid of any objects, is tranquil, self--evident and all pervading. Like the brilliance of a glass or a gem of pure rays, whatever is seen in the world is the brilliance of pure Absolute Brahman.

Lila:—Dear Goddess, who has misled us for these ages past with these false notions of oneness and duality ?

Goddess:—It is simply your incorrect knowledge or want of right thinking that has bewildered you so long. This incorrect thinking arises quite naturally in the midst of men who are thinking similarly. It can only be removed by correct thinking. Why should you be identified with erroneous thinking ? A body that is seen in a dream vanishes on waking, so when the desires are reduced, the attachment to the physical body also vanishes. As a dream body loses its existence after its dream state is known, so when desires subside, the consciousness of body in the wakeful stage vanishes and a person attains liberation in life. Therefore, remove your desires completely and attain salvation (i. e. Moksha).

Lila:—How can knowledge of the self be acquired? How can its study be intently prosecuted and what will be the condition when that is completely known?

Goddess: It requires constant practice, always think of the self, talk of the self and remain devoted to it. Aversion to wordly matters will also help the acquirement of that knowledge. Those who try to feel that the knower and the known are not separate are real seekers after true knowledge. Likes and dislikes can be checked by austerities but they can be reduced to nothingness only by true knowledge.

After these talks, the Goddess and Lila went to another spot for concentration. In that state the Goddess began to move in ether by her spiritual body. Lila did the same. In the region of spirit they saw many worlds. Then they desired to come down to earth. On coming to earth, they saw the house where the Brahman Vasistha had lived. That time all the members of the house were full of sorrow, as the owner of the house (Vasistha) had died 8 days back. Lila and the Goddess wished that those persons might see them. Accordingly, the people of that place saw the two ladies. Lila's eldest son (of her previous birth) and other persons offered flowers at their feet as a mark of respect. Then the eldest son said, "Vasistha and Arundhati were our parents, they have recently died and hence all the world appears blank to us, our house looks like a forest, now please remove our grief, as the sight of great souls like you never goes in vain."

Lila accordingly placed her hand over the head of her son. Her touch gave the son full solace. Other people standing by also got a great relief by the sight of the two ladies. Then the two ladies disappeared. Then Lila desired to see the country in which her husband lived and therefore requested the Goddess to arrange for the same.

The Goddess: Oh, Lila, you have passed through hundreds of births and acted as a wife to hundreds of husbands. I have shown you only three births in which you have seen only three husbands. Of these three, the Brahman Vasistha has been reduced to ashes; King Padma is lying as a corpse under the cover of flowers and the third is ruling as a king now in another world. Now tell me to what husband you propose to be conveyed. Though in the spiritual region all these creations are near, yet physically there is a distance of millions of miles between them. What is known as spirit sprouts up as creation in itself. Just as waves arise and vanish in a lake, so the spirit itself assumes different forms including division of time.

Lila:—Mother, yes, it is just as you said; I begin to remember now all my previous births. I was born of Brahma, the creator at the commencement of the Kalpa (age) and have since-passed through some 800 births in different creations. All of them I remember now.

What Lila saw was merely her own mental creation throbbing with different forms arising out of deep desires ardently cherished by her. The supreme spirit assumes the form of creations arising by thoughts in mind.

Recently, Prof, Milne has pointed out a reason for logical priority of time measurement over distance-measurement: to measure a length one has to say what he means by two points at the same time and thus in principle he requires a definition of distance-simultaneity. To measure a time, he need only say what he means by two events at the same place viz: in his individual consciousness. Thus physical time is not severed from mental time.

Then both the ladies flew by mental process, to the world where Lilal's dead husband, king Padma was ruling as king Vidurath. At that time, a mighty king Sindhuraja had invaded that country with a powerful army and king Vidurath was preparing to face that difficulty. The battle began furious. King Vidurath was somewhat fatigued. Lila and the Goddess, entered the kingdom of Vidurath. When that day's battle was over, the king came back, saw these two ladies and offered flowers at their feet.

The Goddess then asked the king "Who are you, whose son are you and when were you born in this country?" The minister of the king in reply told her that the king's father's name is Nabhoratha and his mother's name is Sumitra, also that his parents had gone to the forest for devotion when Vidurath was only 10 years old.

Then the Goddess asked the king to remember by right thinking his past life and so saying she placed her hand on his head. By that touch, the king remembered his previous sovereignty, as king Padma, his pleasures in the company of Lila and lastly his death. The king also came to know, through the grace of the Goddess, the wonderful range of time-space maya that had spread in his mind. He said to the Goddess "really, **it appears to be a miracle that only a day has passed after my death and here I am seventy years of age.**"

Goddess:—After your illusion known as death was experienced by you, you lost consciousness of that world at that time and in the space of that very house, you got the consciousness of this life. Besides your former world also became manifest in the space of a village which was in the region of the spirit. Owing to differences of time, your wordly life in each creation appeared to be diffrent, you are under a great spell of illusion that you are 70 years old and that you were born of particular parents and that you did particular things. At the moment, you died in your previous birth, this consciousness arose of its own accord in your mind. Just as in dream, in a moment, one experiences a duration of 100 years, in imagination one gets an illusion of life and death. In a dream one sees his head cut off by some one, so you are under the spell of illusion of this world with your various activities therein. As a matter of fact, you are neither born nor dead, you are pure spirit. All these things viz. your town, mountain, river, your enemy and we ourselves even, are not real objects; only people are carrying false activities in false houses in the one universal self.

Vidurath:—Oh, Goddess, if this be so, are these attendants of mine who are alive true like myself?

Goddess:—They are only illusory events in your mind. One who knows the absolute does not think anything connected with the world to be true. False knowledge has created this whole illusion in the form of the world. Just as a living person would surely consider his death in dream to be purely an illusion, so the fear of death in the wakeful state is false. There is no real relation between different events which are associated by the environments of time and space of the wakeful state.

Vidurath;—Oh, Goddess, kindly do me the favour that I may go to my previous body,

Goddess: You will have to die in this battle now and then you will get back to your former kingdom.

In the above narration of the King, he has stated that only a day had passed since his death and there in his life as King Vidurath he was seventy years of age. Modern science of relativity also states that when the personality shifts, time does not mean the same thing. Time is different for each observer. We must first find out a conventional constant of the nature of time which plays the part of the age of that system. An explosion in a distant nebulae may have occurred many centuries ago, though only notified to-day by the arrival of the light-signal. Time denotes a relationship between events and has no objective existence outside those events. If this fact is properly understood, all the questions about time can be simplified.

After the above talk was over, the king Vidurath had to join the battle. The king was killed in the battle and his spirit entered the dead body of king Padma. Lila and the Goddess also went there. Lila asked the Goddess, " Can you tell me how long this king lay in the form of the dead body and how long did I remain in concentration ?"

Goddess:—A month has passed in the condition.

In a short while the face of the King Padma began to bloom and all his limbs gradually got their lustre back. The king prostrated before the feet of the Goddess and prayed for right knowledge, long life and prosperity. The Goddess blessed him and then disappeared.

This story is meant to show the vanity of the world. Space, time, motion, cause and effect are, therein, shown to be relative. Every individual experiences events in accordance with the force of his consciousness. If a man strongly believes even a poison to be nectar, it turns into nectar and if he looks at his enemy with the eye of a friend, the enemy turns into a friend.

If one looks upon the duration of a moment to be an age or Kalpa, it turns out to be so to him and he who thinks an age or Kalpa to be a moment finds that it has that much duration, This is the innate nature of the spirit. This is called Vivarta-Vada in the Vedant philosophy.

The world seems to be moving to one who sails in a ship because the ship is moving. A man may be fighting with another in a dream but another man who may be sleeping near him does not see any fighting. In the same way, a man devoid of right knowledge sees the world and its relative activities of various forms like the man in dream. From the view point of Maya the world appears to be true but appears to be false when seen by pure spirit. When the active habits of the mind lose their active nature, the mind gets liberation. Though many activities are experienceed, nothing really happens. There is only the real Absolute Self. The whole creation with its environments of time, space, motion and matter is nothing but pure sprit like wavelets appearing on clear water. An experience of thousands of years' creation is felt even in a millionth part of a second. A day does not rise or set for every body. So long as the mind is not completely dissolved, thousands of creations appear even in an atom.

As time is not a reality, one should form the habit of transcending time. For this purpose, a great change in habit is required. When the sense of ego is reduced to nothingness, one is absolved of the cycle of birth and death.

3. Story of King Lavan

A third story about the mystery of time is given in Cant. 104, Chapter 3 on creation in the Yoaga Vasistha as follows:—

There was a country called **उत्तर पाण्डव** (Uttar Pandava) on this earth. A king named Lavan was ruling there. Once while he was seated on his throne in full court, a juggler stepped in and after saluting the king, said, "My Lord, I propose to show you a feat of jugglery which you may see from your throne." With these words, he waved over the king a mesmerising cluster of peacock feathers. As soon as the king saw the cluster, a horseman with a horse appeared before him. He told the king that the horse which he had brought was sent to him by his master (another king) as a present. The horse seemed to have a wonderful speed. The juggler requested the King to ride that horse and move about the world. The king was stupefied with the sight of the horse, his eyes got fixed and himself was caught up in a trance on his own royal seat. His attendants did not try to rouse him as they thought that the king might be meditating over something. After a couple of moments, the king regained his consciousness but seemed to be falling down from his seat as if trembling with fear. At that time, one of his servants gave him support. He was then seated in a proper position. The king asked his ministers as to whom this country belonged and whose assembly it was. The ministers wanted to know from the king in return the nature of this delusion. The king was, shortly, restored to his normal condition and then told the members of the court his experiences during that short period as follows:—

"Gentlemen, after seeing the charming handle of the peacock-feather-cluster, I observed a horse. I rode upon it and began to move. I thought I was on a hunting expedition and soon found my self in a forset. I crossed that forest and came to another forest where I slept below a tree. There my horse disappeared. Suddenly, there was night. Next morning, I looked to the east. At noon, I became hungry; then I saw a girl carryng a pot containing cooked rice. I asked her to give me some rice. She told me in return that she was a low-caste (chandala) girl but added that she would gladly comply with my request if I promised to marry her. I agreed to her request as I felt myself in want of food. Then I married her. After some years we had 4 children viz. two sons and two daughters. This became the circle of my family. With the passing of years I became old. Then the country was visited by a great famine; so I moved to some other country with my family. My children on the way cried for food and wanted meat. Due to great attachment to children, I asked them to take flesh from my body and use it as food. They accepted the offer and having prepared a burning funeral pire, just as I was on the point of dropping myself thereon, I got moved on this throne and woke up by the sound of the pipes of this court."

The juggler had disappeared from the court, while the king was narrating his experiences. The king told the members of his court that the man was no juggler but the feat he showed was some supernatural illusion of time-space.

The moral of the story is that every man feels the necessity of satisfying his sense of hunger and sex and therefore with his hopes and fears creates periods of time. As in a dream, so in the waking condition. The mind elongates what is short, renders true what is false and makes a man look upon his friend as an enemy.

The king Lavan then went to see that forest where he asked several persons questions relating to his past experiences. He was really startled to hear the replies given by them. He saw the village where he lived a family life as a chandala. People also told him about the famine in that country.

It is said in the Yoga Vasistha that anything of that nature was possible in a state of unconsciousness. A piece of cloth could be observed in place of a pot in that condition. By the perversity of the brain, a self might see his person in the form of a sheep and the sheep would assume the form of a lion. Sometime ago, a man told me that he saw in his dream, a woman who was then suddenly changed in to a cow and then the cow was changed to dust. These experiences should not be taken at their face value. They show the working of an inferiority complex. When a man feels himself to be an inferior creature, such experiences do happen in a dream condition. No events happen without its relative consciousness.

Our consciousness as man will continue, so long as the time on which it is based will continue.

As time is relative, nothing can be really created and nothing really perishes. When Divine peace is attained, there are no time-space divisions, and therefore there are no worries. Everything is full of bliss when wholeness is realised. It is easy to realise wholeness when time and space are taken as relative, otherwise wholeness will remain as future possibility. But there is no real future. The great spiritual injunction in india is Tattvamasi i. e. "thou art that". It does not mean that "thou will become that". The polities of those whose goal is beyond time are always pacific. According to the new physics, there is no objective past and no objective future. It is the idolators of past and future, of reactionary memory who do the persecating and make the wars. Only the pure (or pak) in heart and spirit can come to the unitive knowledge of God.

It must be remembered that everything does not possess a history. Certain ideas and certain concepts are ultimate for man. The aim of spiritual training is to make people selfless in every circumstance in life, while the aim of military training is to make them selfless only in certain very special circumstances and in relation to only certain classes of human beings.

Knowledge is in the knower according to the mode of the knower. Where the knower is poly-psychic (Dwaitvadi) the universe he knows by immediate experience is also poly-theistic. Sensible love intensifies the ego. Reading of daily and weekly newspapers very often increases disquietitude. Men of saintly nature do not form such habits. God is not a thing or event in time. God is nothing, he can be perceived only by one who in himself is no–thing. Prahlad prayed to God that he should have no desires. Such attitude takes a man beyond time to the Eternal Spirit.

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CHAPTER 12

Concluding Remarks.

The chief merit of the theory of Relativity lies in the fact that it has changed objects into events or in other words it has changed a three dimensional state into a four dimensional continuum. Objects may exist even if there is no observer to know them but events cannot exist without an observer. Besides, the chief merit of subsequent great thinkers on this subject especially in the West lies in the fact that they have shown that the structure of the time-space has intimate relation with the structure of observer's knowledge and vice versa.

The principle of relativity is usually stated in the form that laws of nature are invariat in form for any arbitrary transformation of coordinates. Recently there has been an improvement in this principle made by Prof. E A. Milne, M.A., D. Sc., F. R. S. The leading idea in his work is not that of transformations of co-ordinates but of transformations from observer to "equivalent observer," where the word equivalent is defined in terms of observations and tests which the observer can actually carry out. This new departure can be understood to some extent by the following psychological method.

Supposing, one man wants to go from Bombay to Calcutta. If he wants to find the interval according to Einstein's method he must first find by what means he wants to go i. e. by a motor, by a slow train, by a fast train or by a plane. When this is done, the coordinates of his system will be known and the interval of his journey will be found out. According to Prof. Milne's theory, suppose first we want to change the observer, and suppose that a man in Bombay has got a dream in which he has gone to Calcutta and wants to come back to Bombay. Here, the interval between Bombay and Calcutta does not depend on the coordinates or the instrument (velocity) but on what the observer observes i. e. the knowledge of the observer. Here time–space are connected with the knowledge of the observer. If he wakes up, the interval is practically nothing. If we apply this example philosophically to the human spirit and if we want to find out the interval between God and man, the interval is nothing if the knowledge of the human observer is put in the right condition, and the interval may be ages if his knowledge is limited to a man-sized time and space. Prof. Milne rightly says that we can only get a new fact about the phenomena when we change the point of view i. e. when we change the observer. In this new description, for which he has given a mathematical system, space is at the disposal of the observer. It becomes something like psychical space. According to Einstein's theory, space is a physical space according to the nature of co–ordinates. According to Milne's theory, space depends upon the conversion of observed data into coordinates. I would like to apply this principle to Napolean Bornaparte's life; Napolean was born in Corsica, an island then belonging to France. From the observed data he became a Frenchman and he considered France as his own country i. e. his own space. If he would have been born some time earlier in Corsica when that island belonged to Italy, he would have been an Italian from the observed data which he would have then experienced. Therefore, space depends on the observer's time.

Another but better example to show how space measure is created by time measure is the motion of an aeroplane. The motion of the plane is creating a new space according to the motion, which is observable while the plane is ascending or descending. Human beings and birds and animals also move with different velocities and have therefore different kinds of spaces or worlds.

A man swiming in water creates a new time-space measure by his motion and a fish also creates a new time-space measure by its motion. It is difficult to know the knowledge of one living being by means of the knowledge of another living being having a different time-space measure.

The main question for consideration in physics and philosophy is how and why we experience events in a time-sequence and whether such sequence is basic or superficial ? In this connection, it is first necessary to remember that the only events which an observer actually experiences are events at himself. As in dream, so in the waking condition. Other persons' experiences or observations are not data for him although an agreement of the results of the two measures is necessary to arrive at the truth about the world. The simplest observation is the reading of a "clock" at the moment the event occurs. This is in principle simply the assigning of a number-sequence or number continuum to events which occur in the observer's own experience.

In the general theory of Relativity as formulated by Einstein, coordinates are introduced at the start as a possible conceptual mode of description of events and are then translated into the possible observations which they imply. In Milne's theory, we begin with observations and any coordinates used will be constructed out of observations that have already been made by them. The constancy of the velocity of light is, therefore, a weak point in Einstein's theory. Milne says that we should give no definition of velocity until we have agreed on certain combinations of time observations as representing velocities i. e. velocities cannot be constructed unless clocks are compared. In order to make this point more clear, let us take the example when during the second, war period, the Viceroy of India had given an order that all clocks should be changed by one hour in advance. Then the new time had considerable effect on the lives of the people. Some liked it and some did not like it. Some changed their clocks and some did not. This time was not a correct time and has since been abandoned. Similarly, a man is living in a man–sized world with a man--sized time and a man–sized space in the waking condition but this time–space disappear in the dream condition when new time-space measures are experienced according to the observations made in that condition.

Time and space are, therefore, not objective facts. In his book " The new back--ground of science ", Sir James Jeans says that " space means nothing apart from our perception of objects and time means nothing apart from our experience of events. The theory of relativity gives a correlation of measures instead of a decision of the ultimate nature of anything and therefore it is very useful in understanding the inderscribable (अनिर्वचनीय) Maya. What we do know is a small matter; how do we know is the chief thing.

Before the theory of relativity came, science was tied to abstracting or ' externalising ' its world in order to make its laws communicable.

but in the theory of relativity and in its later developments observer has to be included to find the real truth of all kinds of phenomena. A law has been found in physics which is independent of the coordinates and several persons both in the east and the west are trying to apply this law to psychology and also to philosophy.

Prof. Milne says that the standard metre is of no particular interest in itself. Its importance lies in the attempts to use it to say what we mean by distance between two points or to put it in another way, if we assign some number as the distance between two points here, how can we fix two points in another neighbourhood as having the same distance. It is well known that we cannot answer this question by moving the standard metre itself. Not only can we not be sure that it has not changed in the process of transport but we cannot even say what we would wish to mean by its not having changed for there is no other standard of comparison available. Even the "uncertainty" of length measures of atomic and sub-atomic entities, envisaged by the quantum theory has no meaning until length itself has been defined. A system has no size until an observer and an epoch in his experience are specified. It is a certain set of points in motion. It is only a combination of size and age. Its state cannot be described "at a moment", unlike the physical systems of our local experience. Time is different for each member of the system. The problem then remains of saying what we mean by asking whether two distant intervals of time at different "times" in the experience of the same observer are equal.

The specifications of an equivalence involve simply the motion of each individual member relative to some given number–the relation, that is of a distance at an epoch to epoch for that member. A Kinematic theorem is an inner relation between the different kinematic properties of a kinematic structure. Philosophically, this is experienced in several ways by means of Yoga–sidhis. Physically, the new law possesses the amazing and unexpected property: thus. if we re–graduate all the individual observer's clocks in a suitable fashion and alter all derived measures like lengths in the way implied by this re–graduation, the law of motion transforms itself into the law of constancy of velocity. In the course of the regraduation of clocks, the substratum itself changes its description. This is experienced subjectively in the dream condition also. From being an outwardly receding set of moving particles, arranged with a certain density–distribution, it becomes a homogeneous, relatively stationary set of particles with an absolute simultaneity holding between all its members. There is one essential new feature emerging in this regraduation to carry it out, one has to mention a conventional constant of the nature of a time, which plays the part of the age of the system, as reckoned one, locally measured from the epoch of coincidence of all the members.

Man can control the extent of this simplicity by his choice of the scale of time. Once this is fixed, the forms of laws appear determinate.

The question next for consideration is what is the nature of the world independent of any one observer's subjective peculiarities ?

Both physics and philosophy have so far come to the conclusion that the observer's condition cannot be neglected but that it is possible to accept the reality of time-space measures in one condition without losing sight of their supercession in another kind of experience. This is quite in accordance with the Indian doctrine of Maya. A question that is next to be decided is when this supercession will take place. This is again a question of the relativity of time. Many events of a definite time order happen in dreams and they are immediately superceded by events of a different time order in the waking condition and vice versa. B Russel says "there is some sense easier to feel than to state in which time is an unimportant and superficial character of reality. Both in thought and feeling, to realise the unimportance of time is the gate of wisdom'". This is the reason why the best eastern religions do not give importance to history. When the western religions will be sufficiently attacked by the theory of relativity, they will also begin to give less attention to history and this may eventually lead to prevention of war.

At present, the time-concept of a politician is different from the time concept of a philosopher and as politicians are leading the world, the church appears to have failed in its mission. But a time will come when the church will lead and when historical methods will be broken.

Different scales of time-space are now available in physics and there is no reason why they will not break the head of the uniform time of histories. This depends mainly on finding out the nature of the inertia (तमोगुण). Inertia is a property imposed by motions whose nature is determined by needing to be capable of correlation between observers, and depends to a great extent on its quantity. Therefore, it is necessary to control the rise of populations and encourage marriages between cultural persons. If social science is not to become a chaos of unrelatable opinions, there must be a selection of best human seeds, in the same way as a farmer collects good seeds for cultivation. The tendency of the socialist party or a communist party is to secure equal distribution of wealth but wealth is not the only means for human happiness. There must be a high culture to secure a better use of the well distributed-wealth.

In the mean while, as is proved by science, the only events which an observer experiences are events at himself. Therefore, he need not wait till the society improves. In the dream condition, his society is at himself. Milne says that to measure a time, you need only say what you mean by two events at the same place viz. in your individual consciousness. By this method also, it is possible to achieve a definition of simultaneity between distant events and events at yourself. As in dream so in the waking condition. The distant events and the near events are all personal in dream and in the waking condition. This is proved by Mi'ne's new interpretation of the Theory of Relativity. Einstein's barrier against associating physics with any rational analysis of knowledge is the divorce from experience due to not building relativity upon events in immediate consciousness. At the Einstein level, the gap between physical and pychological approaches to knowledge is too wide. But Milne's new theory admirably bridges this gap. In Milne's theory, since the motions ultimately are those necessary to the mutual consistency of all observers' recording, laws of inertia and of gravitation appear as laws of logic itself and of an entirely different status from the emperical generalisation of previous science. This gives an epistemological aspect to the dependence of inertia upon the aggregated universe which is of immensely greater philosophical significance. In photography, the distances between different persons and in the cinema pictures the intervals between different events are created by the velocity of light; in dreams, the intervals between different events are created by the velocity of the inner light (तेजस्) and in the waking condition also, the intervals between different events are created by the volocity of light. This velocity is not determined until the observations of the observer are determined. The whole development of Milne's work has been seen to emphasise that there can be no unique measure of time. The multiple aspect of any problem enforced by the regraduation of time-scales is a novelty in the light of which many difficulties can be solved and good agreement can be made between physics, psychology and philosophy. This has been attempted in this small book. The largest and most distant universe as well as the earliest and the last universe have some properties of a substratum and these properties are identifiable if a correct time scale is adopted in describing it. If an equivalence is a single unique entity, a pattern of observers' motions such that they agree about a law of nature inspite of those motions, then different sets of equivalent observers give rise to descriptions merely differing according to the differing graduations of their clocks. As in dreams, so in the waking condition.

This new method starts from the same point as that of the psychology of perception, in which simultaneity and succession constitute the complete data of immediate consciouness if events occur at the observer's own situation. As in dream, so in the waking condition. Events thus at any observer form a sequence and can be co-related with a sequence of numbers. Such corelation defines a 'clock' in the most general sense, whatever the mechanism by which the corelation is effected and whatever the scale of graduation, since each event in the observer's experience is thus capable of being labelled by some number which will uniquely define this event's instant or epoch. As in dream, so in the waking condition. Once I had gone to see how cinema is prepared by the shooting process. At the time of shooting the organiser measures the distance from the camera between two persons who are about to talk on the stage and this formed the clock for that event. The other distances of chairs and tables come within the same event as measured by the same clock. For another event another clock is prepared in the same way. The essential feature of relativity physics for logic and for theory of knowledge is that the decision of any one observer is as valid as that of any other. As in the dream of the person, so in the dream of another person. It must, therefore, be recognised that 'change' is not in all branches of physics and psychology capable of being resolved into factors expressible by the measurable 'time' familiar in experiment. Uniformity of events, therefore, means communicability. New scientific laws describe nature in such a form as to be recognisable by all possible experimenters and observers. This is the requirement of enabling knowledge to be communicable instead of remaining individual, in fact of turning mere opinion into science. Lately Martin Johnson D. Sc. has given the name functional dependence to these laws. It means that the physical behaviour is found to be describable by a set of variables, the magnitudes of which under given conditions are relatable to one another by mathematical form. Manipulation of this form, therefore permits, if certain of the variables move over a range discovered by observation, that certain others may be inferred to have definite magnitudes. This is called an Agent–act in the philosophy of relativity by Ushenko. In the Indian philosophical language, functional dependence is called a Karma. This means also that one karma may be the cause of another Karma. This appears to be the reason why a dream continues and why the waking condition continues. In the Indian Vedic philosophy six kinds of Darshans or methods of observation have been given as follows:–

1. Nyaya;
2. Vaisheshic;
3. Sankhya;
4. Yoga;
5. Purva Mimansa;
6. Uttar–Mimansa or Vedant;

In the first five Darshans, as also in biology, sociology and psychology, the method of research is found to contemplate an external Nature which is an assemblage of concepts abstracted from experience. But in the last Darshan i. e. Uttar

Mimansa or Vedant and in the Theory of relativity, the object is not separate from the subject. Even when a separation in time or space is indicated, that is so relative that the interval between two events can be reduced to zero. Then it is possible to apply the example of the observation of a snake in a rope to the world–view as a whole. This brings us to the Vivarta doctrine of Vedant in place of the doctrine of fundamental change in the first five Darshans. The new method of finding out the structure of time-space has intimate connection with the structure of knowledge.

Velocity is the ratio of a length to a time-difference and this is not fixed unless an observer is mentioned. Therefore, the constant velocity of light assumed beforehand by Einstein is a weak point in his theory of Relativity. The whole problem of the description of any event by A and by B turns on the determination by A of the running of B's clock in A's experience. B can carry out similar observations on A. In this way considerable clarity results from confining the world coordinates to constructs from 'pure' measures. This is the new method lately suggested Milne. It has greater merit than the Einstein method. In Milne's system, each uniformly moving particle observer of the system sees himself for all time as the centre of the system and sees the system arranged non-homogeneously, but with the spherical symmetry round himself. As in dream so in the waking condition.

The universe, though describable in the space and time of an observer is neither in space nor in time; to assert either would be meaningless. There is no fundamental entity called "space" existing in itself, in which the world is placed. nor is there any fundamental time in which the world is placed. The dream space does not begin before the dream begins and the dream time does not begin before the dream begins. Similar situation exists for our waking experiences. Out of an observer's temporal experience we construct observed time and out of the same time measures, observer's space. But there is no underlying time or space with which these can conceivably be corelated. Thus the universe and with it, if we posit one, its creator is neither in space nor in time. The event of creation may be placed prior to the experience of any individual, but no meaning can be attached to asking what was prior to creation. For as there were no observers to experience a temporal sequence, the notion of a temporal experience and of time, prior to creation is without any significance.

Then what about God? By taking the very name of God diligently, the human observer is changed into a Divine observer and then he begins to experience cosmos as a whole. Therefore, devotional methods are also useful for the well-being of humanity.

Prof. Milne has made a distinction of physical time into alternate scales, each constraining our knowledge into a different system and therefore has brought physics to a point from whence philosophers will be able to obtain a good guide to lead humanity forward towards right observation and right thinking. Many persons firmly believe that the objects with the world do exist before we see them but this is a great mistake, The meaning of "before we see them" is now made very clear by the Theory of Relativity which has proved by mathematics that there is no before or after absolutely. As in dream, so in the waking condition. This has been proved by many examples given in this book.

We cannot say whether two succeeding periods are equal because there is no uniform scale of time. We cannot catch the fleeting minute and put it alongside a later minute. A system which provides a frame of reference can be used to define a scale of time. In other words, an individual's awareness of something which he calls the passage of time provides measures of length and distance. The means of perception is light but the measure of light is created from the quality of the observations i. e. the corelation of events at the observer is called a clock, arbitrarily graduated. Apparent differences arise from the different possible ways in which the "clock" used by the observers may be graduated. In this way it is possible for a system to maintain relatively stationary equivalence. As in dream, so in the waking condition. Any equivalence generated by some specific function can be transformed into the uniform motion equivalence by suitable clock-regraduation. Therefore, no meaning attaches to the question "What was before creation? The system appears to create the space it needs as it expands. The choice of time-scale does not affect phenomena but only the description of phenomena. Every assertion about the contents of the system involves the mention of the age of the observer and so gives an appearance as if the system was once created. As in dream, so in the waking state. A dream does not appear to be a dream at the time of dream. There is an age for the dream system. At that time it appears like a waking state.

In the kinematic relativity of Milne, length measures are made to depend on time measures.

Therefore, the regraduation of clocks affects all length-measures and so all space-coordinates as well as time-coordinates. It also affects all velocities, changing all velocities into velocities relative to the fundamental particles with which the particles concerned momentarily coincide. This reduces the fundamental particles themselves to relative rest and the life of the system becomes relatively stationary. Until we know which scale of time is being used in any given context, it is impossible to give an unambiguous meaning to any assertion involving time. This means that creation is only just a thing of the past, or the present. This means that there is no real creation. This principle agrees perfectly with the doctrine of non-creation explained in the Mandukya Karika of Shri Gaudapad and in the Yoga-Vasistha, Shri Gaudpad gives the relativity of time in the following verse:—

चित्तकाळा हि येऽन्तस्तु द्वय काळाश्चये बहिः ।
कल्पिता एव ते सर्वें विशेषो नान्य हेतुकः ॥ २-१४.

i. e. Whatever events are imagined in the mind, exist during the inner period. Whatever events appear to exist outside the mind, appear to exist for two periods i. e. mental period and the physical period. All these are relative in the mind of one observer; as in dream, so in the waking condition. This mesns that the only events which an observer actually experiences are events at himself.

When this fact is realised, it is easy to feel oneness of life and consciousness.

When a man gains the consciousness of unity, the consciousness of time and the space as limitations will disappear. A spiritualised man is a new genus of man exhibiting a new quality of life. His self becomes as wide as the universe because there is no fundamental space to restrict his freedom.

When the spiritual perception transcends time and space, it will reveal fundamental properties of the human soul as a whole. It is a function of the total personality, not of an abstracted momentary mental state.

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APPENDIX I.

Some questions and answers.

The following questions were sent to me by Swami Tapovanji now living in the Himalayas:--

1. What is the nature of the observer ? Is it real ?
2. Is the observer eternal ?
3. Whether the observer is one or many ?
4. Why does it observe ?

Answer 1:—Taking the third question first, as space is derivative and not fundamental, there can be only one observer. Time space is not the frame work of nature but of the world of our sense-perception. Distance is defined by certain operations of measurement and not with reference to non-sensical conceptions such as the amount of emptiness between two points. Number cannot enter into the nature of what cannot be objectified. If the distance and place are inconceivable in the absence of the mind of which they are the ideas, the independent existence of the figure which is the limitation of distance must be equally inconceivable. So there is only one observer. The only events which an observer actually experiences are events at himself.

Answer 2:—Regarding question 1, as there is only one observer, it is the only reality.

Answer 3:—The one observer is eternal because there is no fundamental time (according to modern science) to make it temporary. This solves question No. 2.

Answer 4:—Question No. 4 can arise only when there are more than one observer. "It" is a third person pronoun. So there must be:-

(1) An observer who observes.

(2) An observer who questions the observations of the first observer.

As explained above, two observers do not exist. If I observe something, there is no other observer to put me the question why I observe. But I can question myself as to why I observed the dream (which is then a waking state) and the reply is "through ignorance." The same reply applies to my waking condition.

When the personality shifts, time and space do not mean the same thing. The nature of the real observer is सत् चित् आनंद्.

The question "Why does it observe ?" refers to causation which is statistical as explained in chapter 10. Causation does not apply to individual laws.

The following questions were sent to me by an Indian Barrister, to whom the following replies were given:—

5. Question :—You say that no absolute meaning would attach to saying that millions of years have elapsed since creation but all the same millions of miliions years have elapsed since the creation of the sun or a given star.

Answer:—The sun which a man sees existed 8 minutes ago, as sun's light takes 8 minutes to reach him. Besides, the sun is larger than the earth although a man sees it as much smaller than the earth. Therefore, our knowledge about the sun must be taken into consideration i. e. your knowledge about the sun is the sun in question and that sun has not existed since millions of years. A similar situation exists about a given star.

6. **Question:**—Events do exist independent of an observer. The sun was in existence before any human being as 'observer' was evolved millions of years ago out of ameoba.

Answer:—The question is whether the sun as seen by you (which is smaller than the earth) did exist before and my answer is "no". The sun so seen by a man is an event, not an object.

7. **Question**:—Objects do exist for certain given purposes.

Answer:—When objects are created from events, a man gets into a condition which is similar to dream.

8. **Question:**—Why should we neglect objects and start with events ?

Answer:—There are no objects now left in the science of Relativity. Objects require fundamental time and space but the new science has brought us to derivative time and space and to a four-dimensional continuum. Vedant philosophy also brings us to non-duality (अद्वैत).

9. **Question**:—You say that no two persons exactly see the same object but we all see Railway coaches and travel in them.

Answer:—The time and space of a man travelling by a train are different from those of an ordinary non-travelling man. Besides, a child finds the coach larger than what is seen by a grown-up person

10. Question:—Did not the world exist when man was in the stage of ameoba and when no human mind existed for observation?

Answer:—The question is incomplete. The question should be whether the world as observed by you did exist before your birth i. e. whether cinema, radio. aeroplane &c. as experienced by you did exist before your birth and my reply is "no." (The questioners age is now 80, relatively.)

11. Question:—We ought to regulate our activities accordingly for a short time we are here in our sojourn.

Answer:—What is the meaning of "short time here?" The meaning of our activities cannot be known unless a man knows himself. As in dream, so in waking condition.

The following questions were sent to me by an English writer of philosophical works and the following replies were given:—

12. **Question** :—Sir James Jeans seems to be more cautious than before in giving his support to the theory of mentalism. I presume, this is because of the severe criticism he has received from fellow physicists of a materialist nature.

Answer :—Sir James Jeans and others are doubtful as to whether there is a world where there is no observer. But the very thought of such a world will bring the thinker as the necessary observer. Besides, such unknown world must have some time-space division. But time-space are relative and require some observer. They are not parts of the objects. A relative world has existence only when known. There is nothing that is unknown in a dream. Even the self is erroneously known. The condition of a man's knowledge is, therefore, the condition of his world in the dream as well as in the waking state.

13. **Question**:—How do you account for the similarity of all dreams if the world is only my private dream, if as you assert, the world is only my **private** dream ?

Answer :—There are not many dreams. Other persons in my waking state are in my day dream. Self knowledge does not allow the existence of many individuals. Einstein says that the structure of space is not determined unless the functions of the coordinates are known. As dream time and dream space do not begin before the dream begins, waking time and space do not begin before the waking state begins.

14. **Question**:—What guarantee exists that your ultimate state is not also a relative one ?

Answer :—What is the meaning of ultimate ?

The ulitime state is wholeness and does not exclude anything. The infinite does not exclude the finite, yet, there is no conceivable relation between the two. There are no relations except between things finite. There can be no relation between the Absolute and its appearances.

15. **Question**:—There is so much chaos, confusion and strife everywhere that many people in the west are losing heart and have become apprehensive of the advent of a third world war before long.

Answer :—There are bound to be temporary world upheavals but a wise man remains steady in the true vision. The philosophy of relativity makes it clear that sociality is compatible with physical independence of different attitudes towards oneself precisely because the social agent takes all of them except his own, in imagination. B. Russell says "the same reasons which lead to the rejection of substance lead also to the rejection of things and persons as ultimately valid concepts". As in dream, so in the waking condition. Consciousness is never experienced in the plural. Ordinary consciousness is connected with the body and as we have experienced many apparent bodies since childhood, the one consciousness appears to be plural and that consciousness sees plurality outside also. What seems to be a plurality is merely a series of different aspects of one consciousness.

This means that when one is thinking too much about others or is living in such atmosphere, his consciousness is apparently in a false position. This is proved not only by the highest Indian wisdom but also by the new science and by our dreams.

16 Question:—I begin to think that your view of knowledge is a correct one and that, therefore the condition of our knowledge is the condition of our world in both dream and the waking states. The implications of such a view are far reaching. I also begin to agree with you that when one is thinking too much about others, one's consciousness is becoming forcified.

What do you think the contemporary discoveries in atomic research will lead to metaphysically? Do you think it can open a path to agreement with the higher Indian wisdom about the real nature of the world?

Answer:—This question can be considered from two points of view i. e. the point of view of a philosopher and that of a politician or a scientist. If as you agree with me, the condition of our knowledge is the condition of our world in both dream and the waking state and if, suppose, you ask me the above question in your dream, I will only advise you to wake up and you will get the correct answer. Prof. Milne has recently made a great improvement in the theory of Relativity. His leading idea is that that theory is not that of transformations of coordinates but of transformations from one observer to " equivalent observer, " where the word " equivalent " is defined in terms of observations and tests which the observers can actually carry out. In this new description, time and space are at the disposal of the observer. In Einstein's theory, the chief weakness was the constant velocity of light, which as Milne has proved by mathematics should not be fixed before the observations are made. Subsequently, Martin Johnson, D. Sc. in his admirable book " Time, knowledge and nabulae has given a new and better turn to Milne's discovery. All these researches bring us back to the equivalence of waking and dream condition.

Considering your above question from the political and social point of view, we are now passing through a period of social inertia or tamasic Maya. Inertia, according to the latest science, is a property imposed by motions whose nature is determined by needing to be capable of corelation between observers and depends to a great extent on its quantity. Therefore, the more the population increases, the more inertia will be felt in our social dealings; and we come back to Gita's old teaching that out of thousands, very few become philosophers and out of philosophers very few know the supreme truth. We cannot by any means change the nature of cats so that they may not eat rats. Only the means of destruction (viz. Bombs) have changed. The animal spirit in the majority of human beings has not changed. From the practical and scientific point of view causation and determinism are statistical i. e. there are many causes for every event and the more a man depends on society, the less freedom he acquires. But from the cultural and individual point of view, all the events have only one cause viz. ignorance of the individual. As in dream, so in the waking condition. Therefore, humanity, can only progress by transfer of attention from statistical laws to individual laws. Discovery in atomtic research compels the different Governments to give more attention to statistical laws and this brings us to greater inertia or helplessness.

The Indian cultural method is similar to a farmer collecting good seeds for cultivation. Therefore, we should have marriages between cultured persons and then there will be hope of good human crop but to waste time on good cultivation without good seeds is a waste of energy. The tendency of the present world affairs is to secure equal distribution of wealth, but this will not lead to any cultural advance.

17. **Question** :—It is now becoming clear to most thoughtful observers in America and Europe that modern civilisation will eventually be plunged into a third world war. Do you think that this will lead to greater active materialism in its immediate effect or to some kind of spiritual awakening?

Answer:—Spiritual awakening requires plain living and high thinking. Cinemas, radios, aeroplanes and newspapers have increased the number of observations and number of noises so that the total inertia has increased and every new born child is forced into statistical laws. Very few persons get sufficient time for inner personal development.

I have discussed some of the important points in my book "world Peace" a copy of which has been sent to you by book-post to-day.

Another Indian Barrister had put me the following questions:—

18. **Question:**—You are comparing our waking condition with our dream condition and say that they are similar but God has created a real world. He is not a drunkard dreaming bad dreams. Dream condition belongs to man and not to God who has created the world.

Answer:—Similarly God is not a drunkard that he may keep a waking condition similar to a man's waking condition. This is now proved by mathematics in the theory of Relativity.

The following conversation had taken place between two Swamis:— .

19. **Question**:—It is said that love begins with two and ends in one.

Answer:—Yes, that appears to be so.

20. **Question**:—If we apply this principle to our devotion towards God, we shall find God at the end of love, not in the beginning of love.

Answer:—God cannot be partitioned in that way. He must be available in the beginning of love. In the path of knowledge, God is found to exist in the beginning, in the middle and also at the end.

21. Question:—How did God get a space and a time for creating his world? The present science of relativity has proved by mathematcis that space and time are not fudnamental but derivative.

Answer:—That is really wonderful. It requires more powerful God to create an infinite universe than a finite universe.

22. Question:—One school master had raised the question:-We perceive the growth of a tree. Is it not growing independent of our consciousness? Besides, a father is planting a mango tree, so that his future generation may reap the fruits. Here future seems to have some kind of reality.

Answer:—Supposing one observer on a distant star plants a tree and another observer on the sun also plants a tree, we shall find that the growth of the tree on the sun will be completed and the tree will be dried up in about 50 years. The events on the distant star take about 50 years to reach us, so that the tree on the star will appear to be just beginning its growth although both trees were planted simultaneously. For an observer on the star, his tree will grow and decay first and the tree on the sun will appear to grow and decay afterwards.

Besides, the system on which an observer may be sitting will not appear to be moving. For an observer sitting on the earth, the earth does not appear to be moving. For an observer on the sun the earth will appear to be moving. So that if the observer happens to live the life of the tree, he will not experience the growth of the tree, just as a man does not notice his own daily bodily-growth. We see trains moving and stations not moving but if we see from the sun, the whole earth with the stations will appear to be moving round the sun.

Besides, the time of the growth of a tree is somehow related to the time of the observer. If the tree has any power of speech and if the observer were to ask "are you really growing ?" the tree would reply "I am not concerned with your time, I have my own clock for measurement and you have yours, so that it is useless to combine two events with different measures." The growth of an event is only an appearance. An event has a field quality and it is relatively stationary. As in dream, so in the waking condition.

23. **Question:**– One professor writes as follows:—

What is called Adwait (a non-duality) in Vedant is the Absolute beyond time and space. It is self-existent and is not a thing to be aquired. It requires right thinking. That is your doctrine. But this doctrine contains two concepts viz (1) concept by intuition, the changeless, timeless–Brahman. and (2) concept by postulate or concept by time–space, a relative view.

My relative time–space making is an aspect of the eternal Absolute Brahman and right thinking is also a relative time–space making. The observer connected with this thinking is also bound by time–space. All this is relative. The world is made of relations and the thinking I, is also limited, it is time-making, point-making and is an aspect of the eternal. This means that the self is playing with the self.

Answer.:—When a self plays with another self, both are in the time process, and space-process. We want such play as would remove the obstruction or covering over the Absolute.

The Absolute is self-existent, self-conscious and self-blissful. Its nature is to remain self-luminous but we create an obstruction through wrong thinking. This obstruction is removed by right thinking. Right thinking is not required for making the Absolute self-luminous but merely for removing the obstruction of ignorance. In right thinking also, the thinker or observer is temporary but it disappears or is negated as a result of right thinking and then the Absolute is experienced. If time and space are known to be relative, there is nothing to create an obstruction for the realisation of the Absolute.

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APPENDIX II.

The Nature of Reality

(A conversation between Rabindranath Tagore and Professor Albert Einstein in the afternoon of July 14, 1930, at the Professor's residence in Germany.)

E.: Do you believe in the Divine as isolated from the World?

T.: Not Isolated. The Infinite personality of Man comprehends the Universe. There cannot be anything that cannot be subsumed by the human personality, and this proves that the truth of the Universe is human truth. I have taken a scientific fact to illustrate this—Matter is composed of protons and electrons, with gaps between them; but the matter may seem to be solid. Similarly humanity is composed of individuals, yet they have their interconnections of human relationship, which gives living solidarity to man's world. The entire universe is linked up with us in a similar manner, it is human universe. I have pursued this thought through art, literature and religious consciousness of man.

E.: There are two different conceptions about the nature of the universe; (1) The world as a unity dependent on humanity (2) The world as a reality independent of the human factor.

T.: When our universe is in harmony with Man, the eternal, we know it as truth, we feel it as beauty.

E.: This is a purely human conception of the universe.

T.: There can be no other conception. This world is a human world; the scientific view of it is also that of the scientific man. There is some standard of reason and enjoyment which gives it truth, the standard of the Eternal Man whose experiences are through our experiences.

E.: This is a realization of the human entity.

T.: Yes, one eternal entity. We have to realize it through our emotions and activities. We realize the Supreme man who has no individual limitations through our limitations. Science is concerned with that which is not confined to individuals; It is the impersonal human world of truth. Religion realizes these truths and links them with our deeper needs; our individual consciousness of truth gains universal significance. Religion applies values to truth, and we know truth as good through our own harmony with it.

E.: Truth, then, or Beauty, is not independent of Man?

T.: No.

E.: If there would be no human beings any more, the Apollo of Belvedere would no longer be beautiful?

T.: No.

E.: I agree with you with regard to this conception of Beauty but not with regard to truth.

T.: Why not? Truth is realized through man.

E.: I cannot prove that my conception is right, but that is my religion.

T.: Beauty is in the ideal of perfect harmony which is in the Universal Being; truth the perfect comprehension of the Universal Mind. We individuals approach it through our own mistakes and blunders, through our accumulated experience, through our illumined conciousness; how, otherwise, can we know Truth?

E.: I cannot prove scientifically that truth must be conceived as a truth that is valid independent of humanity; but I believe it firmly. I believe, for instance, that the Pythagorean theorem in geometry states something that is approximately true independent of the existence of man. Anyway, if there is a reality independent of man there is also a truth relative to this reality; and in the same way the negation of the first engenders a negation of the existence of the latter.

T.: Truth, which is one with the Universal Being, must essentially be human, otherwise whatever we individuals realize as true can never be called truth, at least the truth which is described as scientific and can only be reached through the process of logic, in other words, by an organ of thoughts which is human. According to Indian Philosophy, there is Brahman, the absolute Truth which can not be conceived by the isolation of the individual mind or described by words, but can only be realised by completely merging the individual in its infinity. But such a truth cannot belong to Science.

The nature of truth which we are discussing is an appearance-that is to say what appears to be true to the human mind and therefore is human, and may be called " MAYA ", or illusion.

E. : So according to your conception which may be the Indian conception, it is not the illusion of the individual, but of humanity as a whole.

T. : In science we go through the discipline of eliminating the personal limitations of our individual minds and thus reach that comprehension of truth which is in the mind of the Universal Man.

E. : The problem begins whether Truth is independent of our consciousness.

T : What we call truth lies in the rational harmony between the subjective and objective aspects of reality, both of which belong to the super-personal man.

E. : Even in our every day life we feel compelled to describe a reality independent of man to the objects we use. We do this to connect the experiences of our senses in a reasonable way. For instance, if nobody is in this house, yet that table remains where it is.

T. : Yes, it remains outside the individual but not outside the universal mind. The table which I perceive is perceptible by the same kind of consiousness which I possess.

E. : Our natural point of view in regard to the existence of truth apart from humanity cannot be explained or proved, but it is a belief which nobody can lack-no primitive beings even. We attribute to Truth a super-human objectivity; it is indispensable for us, this reality which is independent of our existence and our experience and our mind–though we cannot say what it means.

T.: Science has proved that the table as a solid object is an appearance, and therefore that which the human mind perceives as a table would not exist if that mind were naught. At the same time it must be admitted that the fact, that the ultimate physical reality of the table is nothing but a multitude of separate revolving centres of electric forces, also belongs to the human mind.

In the apprenhension of truth there is an eternal conflict between the universal human mind and the same mind confined in the individual. The perpetual process of reconciliation is being carried on in our science and philosophy and in our ethics. In any case, if there be any truth absolutely unrelated to humanity, then for us it is absolutely non-existing.

It is not difficult to imagine a mind to which the sequence of things happens not in space, but only in time like the sequence of notes in music. For such a mind conception of reality is akin to the musical reality in which Pythagorean geometry can have no meaning. There is the reality of paper, infinitely different from the reality of literature. For the kind of mind possessed by the moth, which eats that paper, literature is absolutely non-existent, yet for Man's mind literature has a greater value of truth than the paper itself. In a similiar manner, if there be some truth which has no sensuous or rational relation to the human mind it will ever remain as nothing so long as we remain human beings.

E. : Then I am more religious than you are.

T. : My religion is in the reconciliation of the super-personal man, the Universal human spirit, in my own individual being. This has been the subject of my Hibbert Lectures, which I have called " The religion of Man. "

Note by the author:—In this conversation Einstein wanted to prove that truth is independent of human consciousness and poet Tagore wanted to prove that if the human consciousness widens, it can comprehend the truth. But widening of consciousness removes the obstacles, it does not create truth. If truth is created, it can be destroyed also. Poet Tagore says that a sequence of things in truth can take place like the sequence of notes in music. Sequence requires some common time to connect the different notes. Such a time does not exist. This has been proved by many examples in this book. Therefore, there cannot be any sequence in Truth If there is, truth will undergo changes and may be lost. Besides, it is not possible to experience simultaneous harmony with infinite notes of infinite time orders. According to Einstein, if truth is independent of human consciousness, we can realise it more by negation of limited experiences than by positive methods. This is the line adopted by the Vedant system. The negative method removes the obstacles over truth which is self-existent, perfect, eternal, self-luminous and full of bliss unlimited.

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ERRATA

Page	Line	Incorrect	Correct
5	23	axoms	axioms
36	18	dees	sees
40	8	valocity	velocity
41	10	valocity	velocity
42	23	domnated	dominated
46	16	physicals	physical
		tate	state
46	16	depedent	dependent
49	23	givc	give
57	16	afterwords	afterwards
71	last	as	us
73	10	existance	existence
76	18	Sndama	Sudama
77	10	serpant	serpent
79	4	s	a
79	16	vorious	various
79	17	of	or
108	12	ome	some

Page	Line	Incorrect	Correct
109	15	observe	observes
120	6	want	wants
120	16	eth r	ether
137	22	same	some
142	12	th ught	thought
142	19	b ccmes	becomes
145	8	br ught	brought
146	23	given by in	given in
159	2	was	is
167	last	futurs	future
174	15	universd	universe
174	21	othe	other
182	1	a dynamic	adynamic
184	2	polic men	policemen
220	5	meaning	no meaning
225	17	experience	experience that
249	25	sprit	spirit
251	last	carryng	carrying
254	14	polities	politics
260	22	inderscribable	indescribable

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12 *Africa*-Devram Liladhar; P. O. Box. 360
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Politics and sociology believe in change and progress to which there is no stop. But what is an observed change? what is the measure of an observed change? who has created the observed space between two persons? and who creates the interval between two events?

This book will help the reader to solve these questions and to neglect all histories and geographies and to concentrate his life to the realisation of the Supreme Eternal Spirit.

With this knowledge, travelling hy aeroplanes to see various countries will not be necessary, and cinema, newspaper and radio will not be required as right observation will bring wonders of wonders to the doors of the reader.

* * *

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